ATWATER (H. H.)

ANALYSIS

OF

ONE THOUSAND CASES OF MIDWIFERY

IN THE PRIVATE PRACTICE

OF

H. H. ATWATER, A.M., M.D.,

Instructor in Obstetrics and Diseases of Women in the Medical Department of the University of Vermont.

Reprinted from the AMERICAN JOURNAL OF OBSTETRICS AND DISEASES OF WOMEN AND CHILDREN, *Vol. XII., No. II., April*, 1879.

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Analysis of One Thousand Cases of Midwifery in the Private Practice

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THE hope that some deductions of interest and value may be drawn from the following statistics and the explanatory remarks appended, has induced me to prepare them for publication.

DELIVERIES.

Full term....	907	1 in 1.1	or 90.7	per cent of all deliveries.
Premature....	48	1 in 20.83	or 4.8	" "
By abortion..	45	1 in 22.22	or 4.5	" "
Total.....	1000			

ABORTIONS.

American women.....	18	1 in 2.5	or 40.00	per cent of all abortions.
Irish "	16	1 in 2.81	or 35.55	" "
French "	7	1 in 6.42	or 15.55	" "
Negro "	2	1 in 22.5	or 4.44	" "
English "	1	1 in 45.0	or 2.22	" "
Scotch "	1	1 in 45.0	or 2.22	" "
Total.....	45			

Before end of 2d month.....	10	1 in 4.3	or 23.25 per cent of all abortions of known period.
Between 2d and 3d "	14	1 in 3.07	or 32.55 per cent of all abortions of known period.
" 3d and 4th "	9	1 in 4.77	or 20.93 per cent of all abortions of known period.
" 4th and 5th "	5	1 in 8.6	or 11.62 per cent of all abortions of known period.
" 5th and 6th "	5	1 in 8.6	or 11.62 per cent of all abortions of known period.
Of unknown period.....	2		
Total.....	45		

PARTURIENT WOMEN.

Irish	descent.....	393..1 in	2.54..or 39.3	per cent of all	deliveries.
American	"	284..1 in	3.52..or 28.4	"	"
French	"	260..1 in	3.84..or 26.0	"	"
African	"	22..1 in	45.45..or 2.2	"	"
English	"	21..1 in	47.61..or 2.1	"	"
German	"	12..1 in	83.33..or 1.2	"	"
Scotch	"	6..1 in	166.66..or 0.6	"	"
Italian	"	1..1 in	1000.00..or 0.1	"	"
Jewish	"	1..1 in	1000.00..or 0.1	"	"
Total.....		1000			

Whole number of primiparous cases.. 236..1 in 4.23..or 23.6 per cent of all deliveries.
" " pluriparous cases... 764..1 in 1.3 ..or 76.4 per cent of all deliveries.

Total..... 1000

Legitimate births..... 986..1 in 1.01..or 98.6 per cent of all deliveries.
Illegitimate " ..... 14..1 in 71.42..or 1.4 " "

Total..... 1000

DELIVERIES.

Between 6 P.M. and 6 A.M.. 523..1 in 1.87..or 53.36% of all deliveries.
" 6 A.M. and 6 P.M.. 457..1 in 2.14..or 46.63% "
Not recorded..... 20

Total..... .. 1000

AGE of youngest mother..16, of French descent and married.
" oldest mother.....46, of Irish " "

Delivery at 17th pregnancy....1

PRESENTATIONS.

Vertex at full term... 878..1 in 1.02..or 97.44% of all vertex presentations, and 96.37% of all at full term.
" premature.... 23..1 in 39.17..or 2.55% of all vertex presentations.

Total..... 901..1 in 1.05..or 94.54% of all known presentations of child.

Breech at full term... 24..1 in 1.5 ..or 66.66% of all breech presentations. Breech, 15; Footling, 9.
" premature.... 12..1 in 3.00..or 33.33% of all breech presentations. Breech, 8; Footling, 4.

Total..... 36..1 in 26.47..or 3.77% of all known presentations of child.

Shoulder at full term. 3..1 in 2.33..or 42.85% of all shoulder presentations
" premature.. 4..1 in 1.75..or 57.14% " "

Total..... 7..1 in 136.42..or 0.73% of all deliveries except abortions.

Placenta previa at full term..4..1 in 2.00..or 50.00% of all placenta previa presentations.
" " premature....4..1 in 2.00..or 50.00% of all placenta previa presentations.

Total..... 8..1 in 119.37..or 0.83% of all deliveries except abortions.

Funis (full term)..... 2..1 in 477.5 ..or 0.2% of all deliveries except abortions.

Face { forehead, 6 / full face, 2 } ..... 8..1 in 119.37..or 0.83% of all deliveries except abortions. Full term, 6; Premature, 2.

Complex (vertex, foot and funis).. 1..1 in 955.00..or 0.1% of all deliveries except abortions.

Unknown..... 13

Hand by side of head in vertex presentations. 6..1 in 151.16..or 0.66% of all vertex presentations.

POSITIONS OF VERTEX PRESENTATIONS.

First position....599..1 in 1.5 ..or 74.78% of all known positions.
Second " ....165..1 in 4.85..or 20.61% " "
Third " .... 18..1 in 44.5 ..or 2.24% " "
Fourth " .... 19..1 in 42.15..or 2.37% " "

Total.....801
Unknown.....106

DURATION OF LABOR.

One hour.. ..... 8..1 in 119.37..or 0.83 per cent of all deliveries except abortions.
Between 1 and 2 days... 95..1 in 10.05..or 9.94 per cent of all deliveries except abortions.
" 2 and 3 " .. 14..1 in 68.21..or 1.46 per cent of all deliveries except abortions.
Three days..... 2..1 in 477.5 ..or 0.2 per cent of all deliveries except abortions.
Four " ..... 3..1 in 318.33..or 0.31 per cent of all deliveries except abortions.
One week..... 1..1 in 955. ..or 0.1 per cent of all deliveries except abortions.

TWIN CASES.

American women.. 7..1 in 1.71..or 58.33 per cent of all twin cases.
Irish " .. 3..1 in 4.0 ..or 25.0 " "
French " .. 2..1 in 6.0 ..or 16.66 " "

Total.....12..1 in 79.58..or 1.25 per cent of all deliveries except abortions.
At full term.....10..1 in 1.2 ..or 83.33 per cent of all twin cases.
Premature..... 2..1 in 6.0 ..or 16.66 " "

Vertex and breech presentation..6..1 in 2.0..or 50.00% of all twin cases.
Both vertex " ..4..1 in 3.0..or 33.33% " "
Vertex and shoulder " ..1..1 in 12.0..or 8.33% " "
Both breech " ..1..1 in 12.0..or 8.33% " "

One placenta..... 4..1 in 2.25..or 44.44% of all known.
Two placentæ..... 5..1 in 1.8 ..or 55.55% " "

Both male children..... 4..1 in 3.0 ..or 33.33% of all twin cases.
" female " ..... 4..1 in 3.0 ..or 33.33% " "
Male and female children.. 4..1 in 3.0 ..or 33.33% " "

RETAINED PLACENTA.

Delivered by introducing hand into uterus (1 adherent). 10..1 in 95.5 ..or 1.04% of all deliveries except abortions.

HOUR GLASS CONTRACTION OF UTERUS..... 3..1 in 318.33..or 0.31% of all deliveries except abortions.

POST-PARTUM HEMORRHAGE.....18..1 in 53.05..or 1.88% of all deliveries except abortions.

ANTE-PARTUM ACCIDENTAL HEMORRHAGE.. 2..1 in 477.5 ..or 0.2% of all deliveries except abortions. 1 from a fall; 1 with breech presentation.

RUPTURE OF PERINEUM.

Partial	All primiparæ. 11 with forceps.	12
Complete	2 without forceps.	1
Total.....		13..1 in 73.46..or 1.36% of all deliveries except abortions.

MOLAR PREGNANCY.....2..1 in 500.0..or 0.2 per cent of all deliveries. 1 hydatidiform, delivery at 7th month; 1 blood-clot filling ovum, delivery at 3d month.

OVARIAN TUMOR, with delivery at full term, occurring in one patient, who had three abortions previously. 2..1 in 477.5..or 0.2 per cent of all deliveries except abortions.

PUERPERAL ECLAMPSIA.

Before delivery..... 4..1 in 3.0 ..or 33.33% of all cases of eclampsia.
After " ..... 5..1 in 2.4 ..or 41.66% " "
Before and after delivery.. 3..1 in 4.0 . or 25.00% " "

Total.....12..1 in 79.58..or 1.25% of all deliveries except abortions.

With legitimate births..... 9..1 in 1.33..or 75.00% of all cases of eclampsia.
With illegitimate " ..... 3..1 in 4.00..or 25.00% " "

Total..... 12

HYSTERICAL CONVULSIONS..2..1 in 500.00..or 0.2% of all deliveries.

PUERPERAL FEVER.....4..1 in 250.00..or 0.4% " "

PARALYSIS AFTER DELIVERY.4..1 in 250.00..or 0.4% " " 2 of face; 1 of right side of body; 1 of optic nerves.

PHLEGMASIA DOLENS.....3..1 in 333.33..or 0.3% of all deliveries.

FIBROUS TUMOR OF VAGINA..1..1 in 1000.00..or 0.1% " "

CICATRICES OF VAGINA..1 from previous rupture of perineum.—Obstruction to labor relieved by dividing with bistoury in three places.

DISLOCATION OF COCCYX..1 primiparous case, and forceps used.

THROMBUS OF VAGINA...2—1 before and 1 after delivery; spontaneous rupture of the first, and incision of the other.

UNCONSCIOUS PARTURITION without anesthetics.....1, caused by fright, and followed by hemiplegia.

SPONTANEOUS EVOLUTION of shoulder to breech presentation. 1 premature; weight of child 6 lbs; diseased and still-born.

INDUCTION OF PREMATURE LABOR. 2 for contracted pelvis, in same patient; once at eighth month, breech presentation, child still-born; once at seventh month, shoulder presentation; version performed and child lived. Craniotomy had been performed twice previously.

DELIVERIES ASSISTED BY	forceps....64	1 in 14.92	or 6.7 per cent of all deliveries except abortions.
" "	vectis.....12	1 in 79.58	or 1.25 per cent of all deliveries except abortions.
" "	version....10	1 in 95.5	or 1.04 per cent of all deliveries except abortions.
" "	fillet..... 4	1 in 238.75	or 0.41 per cent of all deliveries except abortions.
" "	craniotomy. 3	1 in 318.33	or 0.31 per cent of all deliveries except abortions.
Total.....	93	1 in 10.26	or 9.73 per cent of all deliveries except abortions.
ANESTHETICS ADMINISTERED.....	101	1 in 9.9	or 10.1 per cent of all deliveries.

DEATHS OF WOMEN.

From difficult and protracted labor..	3	1 face presentation, chin posterior delivery with forceps; 1 delivered by craniotomy, and 1 twin case, illegitimate, hour-glass contraction and post-partum hemorrhage.
From puerperal eclampsia.....	7	2 were illegitimate cases.
" fever.....	3	1 primiparous, 40 years of age; craniotomy; adherent placenta.
From placenta previa centralis.....	1	death 14 hours after delivery; shoulder presentation of child; version.
From hydrothorax.....	1	death 8th day after delivery.
Total.....	15	

NOTE.—4 of the deaths were consultation cases; 3 eclampsia and 1 placenta previa.

FUNIS around neck, once...144
" " twice... 22
" " thrice.. 2

Total.....168..1 in 5.68..or 17.59 per cent of all deliveries except abortions.

KNOT IN FUNIS..... 2..1 caused death of the child, and labor at 6th month.

Number of male children..510..except abortions.
" female " ..447.. "

AVERAGE WEIGHT.

Of male children at full term.....No. 468 = 7.43 lbs.
Of female " " ..... " 408 = 7.40 "

Of total number at full term..... 876 = 7.42 lbs.
Number weighing 10 lbs..... 52
" " 11 "..... 21
" " 12 "..... 5

One of greatest weight.....16 lbs..hydrocephalic; still-born; breech presentation.

NUMBER OF CHILDREN STILL-BORN, OR WHO DIED WITHIN TWENTY-FOUR HOURS. 79..1 in 12.08..or 8.27 per cent of all births except abortions.

CAUSES OF DEATH OF CHILDREN.

Premature birth. { 11 with breech presentation. / 4 with eclampsia of mother. } ..32..1 in 2.46..or 40.5% of all births except abortions.

Placenta previa presentation (3 premature)..... 7
Shoulder presentation..... 1
Breech " (at full term)..... 4
Face " (1 deformed)..... 3
Funis " 3
Craniotomy..... 3
Syphilitic disease of child..... 3
Hydrocephalic " (2 premature)..... 3
Spina bifida " 1
Knot in funis (premature)..... 1
Funis three times around neck..... 1
Mismanagement of midwife..... 1
Lingering labor, forceps, and faulty position..... 4 (1 with eclampsia of mother).
Unknown..... .....12 (1 with eclampsia of mother).

CONGENITAL DEFORMITIES OF CHILDREN.

Spina bifida..... 3..1 still-born; 1 died in twelve days; 1 died in five weeks.
Hydrocephalus..... 3..2 still-born, premature; 1 still-born, full term.
Extra little finger on each hand.. 1..removed one week after birth.
Encysted tumor behind one ear.. 1

Imperfect limbs	1	stumps of arms and legs with perfect toes and fingers; still-born.
Talipes varus, both feet	1	
Imperforate rectum	1	septum one inch within sphincter; perforated with blunt probe, with relief.
Cataract in both eyes	1	
Total	12	1 in 79.58 or 1.25% of all deliveries except abortions.

CHILDREN INJURED DURING PARTURITION.

Thrombus of scalp	6	1 caused by forceps, recovered; 1 by parturition, died third day; others recovered.

One child had convulsions, commencing three days after delivery, and continuing nine days; apparently caused by retention of a small mass of meconium, for the child at once recovered after its discharge, by the operation of a cathartic.

Another child also had convulsions, commencing at same period and continuing eight days; cause unknown; child recovered.

Particulars and Recapitulation of Placenta Previa Cases.

No. 1.—Mrs. J——; American; second pregnancy; placenta previa central; duration of labor, four days; shoulder presentation of child; ante-partum hemorrhage profuse, partially controlled by tampon. First hemorrhage began several weeks previous to labor, which was arrested by rest and opium. Delivery by version; male child still-born; weight, eight pounds; mother died fourteen hours after delivery; consultation case.

No. 2.—Mrs. P——; French; third pregnancy; placenta previa marginal; duration of labor, twenty-six hours; vertex presentation, first position. First hemorrhage March 7th, arrested by rest in horizontal posture. March 9th, hemorrhage recurred, with slight pains, and os uteri slightly dilated. Tamponed the vagina, March 10th; removed the tampon, no hemorrhage, March 11th; tamponed again for hemorrhage, March 12th. 3 o'clock A.M., pains with oozing of blood by side of tampon; removed it, and found the os dilated to the size of a silver dollar. With every pain there was hemorrhage. I gave her ergot, and ruptured the membranes. Soon the pains became more efficient, forced the head down upon the placenta, and arrested the hemorrhage. The child was born at 10½ o'clock A.M., without manual interference. Male child still-born; weight, eight pounds; mother greatly exhausted; pulse scarcely perceptible at the wrist; administered alcoholic stimulants and cinnamon freely. Patient had a slow recovery.

No. 3.—Mrs. M——; colored; eighth pregnancy; placenta previa marginal; duration of labor eighteen hours; vertex presentation, first position; I gave ergot, and the hemorrhage was soon controlled, and child born alive, without assistance. Female child; weight, five and one-half pounds. There was slight hemorrhage

a short time previous to labor, which was controlled by rest. Mother and child did well.

No. 4.—Mrs. L——; Irish; pluriparous case; placenta previa marginal; duration of labor, sixteen hours; vertex presentation, first position; profuse ante-partum hemorrhage. I administered chloroform, and delivered by version. Male child still-born; weight seven pounds. Mother died six weeks after, of diarrhea and dysentery.

No. 5.—Mrs. K——; French; third pregnancy; placenta previa central; duration of labor, six hours; shoulder presentation; profuse ante-partum hemorrhage. I administered chloroform, and delivered by version. Female child, premature, seventh month, lived half an hour; weight six pounds. Mother had a good recovery.

No. 6.—Mrs. J——; American; second pregnancy; placenta previa marginal; duration of labor, three hours; vertex presentation, first position; profuse ante-partum hemorrhage. Repeated doses of ergot having failed to control the hemorrhage, I delivered by version. Male child, premature, eighth month, still-born; weight seven pounds. First hemorrhage three weeks previous to labor, controlled by rest and opium. Post-partum hemorrhage moderate; brandy was given freely during the labor. Mother had a good recovery.

No. 7.—Mrs. C——; Irish; sixth pregnancy; placenta previa central; border of placenta detached, and lying in the vagina; duration of labor sixty-seven hours; vertex presentation, first position; profuse ante-partum hemorrhage. I administered chloroform, and delivered by version. Female child still-born; weight nine pounds. Mother had a good recovery.

No. 8.—Mrs. C——; Irish; sixth pregnancy; placenta previa marginal; duration of labor, ten hours; vertex presentation, third position; profuse ante-partum hemorrhage, which was controlled by ergot. I delivered with the forceps, on account of exhaustion of the patient and delay caused by position of the child. Alcoholic stimulants and quinine were given. Male child, premature, eighth month; still-born; weight eight pounds. Mother had a slow recovery.

Recapitulation.—Whole number 8. All pluriparæ. Central 3; two with shoulder and one with vertex presentation. Marginal 5; all vertex presentation. Irish 3; French 2; American 2; colored 1. Tampon in two cases. Delivered by version 5; with forceps 1; without operative interference 2. Deaths of mother 1, fourteen hours after delivery, and 1 six weeks after, of diarrhea and dysentery. Recoveries, 6. Children born at full term 4; premature 4. Still-born 6; alive 2, one of whom was premature, and died in half an hour. Consultation case, 1.

Recapitulation of Puerperal Eclampsia Cases.

Whole number 12, American 5; French 5; Irish 1; English 1. Legitimate 9; illegitimate 3. Stout figure 5; spare 5; medium 2. Edematous 4. Previous ill-health 3. Full term 6; premature 6. First pregnancy 9; pluriparæ 3. Duration of labor less than twenty-four hours 9; over 2. Convulsions before delivery 4; after 5; before and after 3. Deaths of mothers 7; recoveries 5. Male children 4; females 5; unknown 3, Still-born 7, two full terms, and five premature; living 3; unknown 2. Consultation cases 5.

Particulars and Recapitulation of Face Presentation Cases.

No. 1.—Mrs. R——; Irish; first pregnancy; forehead presentation, chin anterior; full term; duration of labor, sixteen hours; female child, weight nine pounds. Natural labor.

No. 2.—Mrs. M——; Irish; ninth pregnancy; full face presentation, chin posterior; full term; duration of labor, thirty-six hours; male child, still-born, weight ten pounds. I called Dr. K. as counsel, and we decided to perform version. I introduced my hand into the uterus, and not finding the feet readily, but the head movable, I changed my plan, and brought down the vertex presenting, as I supposed, and withdrew my hand. After a few pains, the head entered the superior strait, and became fixed, and the presentation was not corrected, but was still face. It was now too late to turn, and after several hours, no progress being made, and the pains becoming feeble, we gave two doses of ergot, which brought on pains of terrific force, and forced the head down low in the cavity, where it became impacted and the labor was again delayed for several hours. We each tried to deliver with the forceps, and failed. Then, the patient beginning to get exhausted, Dr. T. was called in counsel. He tried the forceps, and they slipped off twice. The third time, by great effort, he succeeded in delivering her. She was greatly exhausted, pale, and pulseless. We administered brandy and cinnamon freely, and she rallied slightly, but sank again, and died the next day from no other cause known, except exhaustion.

No. 3.—Mrs. R——; French; sixth pregnancy; full face, chin anterior; full term; duration of labor, six hours; male child, still-born, weight seven pounds. Delivery by version. I had delivered the same patient by version in a previous labor, for shoulder presentation.

No. 4.—Mrs. R——; French; fourth pregnancy; premature six and one-half months; forehead, chin posterior; duration of labor, twenty-two hours; female child, weight four and one-half pounds, delivery with vectis.

No. 5.—Mrs. B——; French; second pregnancy; full term;

forehead, chin posterior; duration of labor, thirty-six hours; female child, weight five and one-half pounds. Natural labor.

No. 6.—Mrs. G——; American; first pregnancy; premature seventh month; forehead, chin posterior; duration of labor, twenty hours; male child, weight three and one half pounds; child died in one month and eight days. Delivery with forceps.

No. 7.—Mrs. W——; English; fourteenth pregnancy; full term; forehead, chin posterior; duration of labor, twelve hours; female child, weight seven pounds. Delivery with forceps.

No. 8.—Mrs. L——; French; third pregnancy; full term; forehead, chin posterior; duration of labor, eighteen hours; female child, still-born, weight six pounds; limbs deformed. Delivery with forceps. Consultation case.

Recapitulation.—Whole number 8; French 4, Irish 2, American 1, English 1; first pregnancy 2, pluriparæ 6; full term 6, premature 2; full face 2, forehead 6; chin anterior 2, posterior 6; duration of labor less than twenty-four hours 6, over 2; male children 3, female 5; still-born 3, one full-term deformed, delivered with forceps, one full-term by version, and one full-term with forceps; born alive 5, one of whom premature died in one month and eight days; death of mother 1, natural labor 2; delivery with forceps 4; with vectis 1; by version 1. Consultation case 1.

Periods of Abortion.—The statistics, without explanation, would convey, in part, an erroneous impression with regard to the most frequent period of abortion; namely, that the greatest number of abortions occur between the second and third months of gestation; whereas the fact is doubtless that this is the case with the period from conception to the end of the second month, for many more abortions of this period escape the observation of the patient, and still more that of the physician, than of any of the other periods. But, laying this one aside, the comparative frequency of the other divisional periods will probably accord with the conclusion of other observers, that the greatest proportional number occur between the second and third months.

Hour of Birth.—It will be seen that, contrary to the prevalent belief of those outside of the profession, the excess of children born during the night-time over those born during the day-time is small; the proportion being as 53 to 46 per cent. Indeed, I know of no reason why there should be any difference, except to satisfy the wish of the mothers.

Cranial Presentations.—The record shows, as usual, the great preponderance of cranial over all other presentations of the child at full term, being 96 per cent. On the other hand, of those born prematurely, only a little more than one-half were cranial. We draw the conclusion from this, that many children do not assume the position in the uterus, necessary to give us this favorable presentation, until the last months of gestation, and this fact lends plausibility to the theory that the cervix of the uterus expands gradually during the last months, or those in which premature labor occurs, and not rapidly just before the full period of gestation. Much has been written, and many theories advanced, to account for this almost constant position of the child in the uterus at full term. Of the modern theories, it seems to me that the influence of gravity, except in a minor degree, has been disproved. The theory, too, that the fetus, by instinctive impulse, or act of volition, executes movements just at the proper time, and in the proper direction, to get into this desirable position, is not tenable in the light of the present knowledge of the functions of the cerebral and spinal systems, and is like the idea of the ancients, that the fetus makes its escape from the uterus by its own efforts at the time of parturition, as the chick does from its shell. The movements of the fetus are doubtless the effect of reflex action, originating in the spinal cord, while soon after birth the movements of the child become instinctive, and later on in its development they come under the control of volition. If we consider the fetus as a double ovoid body, the head constituting one and the smaller ovoid, and the trunk with the limbs flexed the other and larger one; then, if we consider also the cavity of the uterus, when fully developed in gestation, as a double ovoid, with the smaller ovoid downwards, and developed during the last three months, I believe that the argument of Cazeaux, that the form of the cavity of the uterus in the last months of pregnancy and the form of the fetus act *mechanically* upon each other, to induce and maintain this position of the fetus, taken in connection with its reflex movement and possibly in a slight degree with the influence of gravity, pretty satisfactorily solves the problem of the great frequency of cranial presentations.

Breech Presentations.—The proportional number of breech

presentations to the whole is larger than that which Leishman states it to be; namely, about 1 in 45 mature births, for here it is about 1 in 38, but agrees with Ramsbotham's estimate. Just one-third were premature deliveries. The deaths of mature children with this presentation were 1 in 6.

Shoulder Presentations.—The number of shoulder presentations, in proportion to the whole, is larger than Leishman gives from statistics of Dr. Churchill; namely, 1 in 231¾ cases, while here it is 1 in 136½.

The history of the *first* case of this presentation is interesting as showing the liability to repeated abnormal labors in the same patient. This one had also a shoulder presentation of the child in a previous labor, and subsequently she had a face presentation at one labor, and a still-born hydrocephalic child at another. Version was performed for her in the two shoulder and the face presentations. The child was still-born at this labor.

In the *second* case, the presentation was complicated with placenta previa centralis. A still-born child was delivered by version, and the mother died fourteen hours after delivery.

The *third* case was that of the last one born of twins, and was delivered alive by version.

The *fourth* case was a premature labor, and delivery of a still-born child was effected by version.

The *fifth* case was complicated with placenta previa centralis. The child was delivered by version, and lived half an hour.

The *sixth* case was a premature labor, and just as I was about to turn, spontaneous version to a breech presentation occurred, and a still-born child was delivered without assistance. The child was small and pelvis roomy.

The *seventh* case occurred in connection with a contracted pelvis, in which premature labor was induced at the seventh month, and the child was delivered alive by version. The history of this woman will be given more fully, under the head of craniotomy cases.

An analysis of these cases corroborates the views of other observers as to the causes of these presentations. The first one, that there is some anatomical peculiarity in the maternal organs in some cases, which is persistent, and causes the same

or a similar accident in successive pregnancies. The second and fifth, that the implantation of the placenta in the inferior segment of the uterine cavity operates as a cause, by filling the space that should be occupied by the head of the child, and crowding this into one or other iliac region. The fourth, sixth, and seventh, that premature delivery before the fetus is finally adjusted to the fully developed uterine cavity furnishes these, as well as breech presentations. The delivery in these cases, without mutilation of the child, must always be effected by version, either spontaneous or operative, and cases of spontaneous are so rare that they may be left out of the account. Therefore we must resort to operative version, by some one of the several methods now practised. First, by external manipulation only, if possible; next, by the combined external and internal manipulation, to produce either cephalic or podalic version; and lastly, if these fail, by the old method of podalic version, by introduction of the whole hand into the uterus. With a knowledge of these several methods at our command, and with the assistance of chloroform, to produce relaxation and lessen the shock, the prognosis for the mother ought to be exceedingly favorable, and not by any means such as Churchill's, when he estimates that out of 235 cases 1 in 9 of the mothers were lost. The single death in the above cases was caused by the hemorrhage of a placenta previa centralis, and the patient was moribund before delivery was attempted. This will be referred to again among the placenta previa cases. The mortality to the children is necessarily large, because of their frequent immaturity, connection with complications, and the conversion into a breech presentation, which always involves additional risk to the child.

Placenta previa.—The proportion of this accident is considerably larger than statistics usually show, and when two of these frightful cases occurred to me within one week, in the course of a moderate practice, I thought I had more than my share. The proportion estimated by Johnson and Sinclair is 1 in 573 cases, while here it is 1 in 119. The causes are obscure, but a clue is furnished by the fact that nearly all the cases occur in pluriparæ. My cases were all such. The uterus is left enlarged, and the cavity somewhat increased in size, and the mucous membrane consequently being expanded, is not so

greatly convoluted at the menstrual periods, after the occurrence of the first pregnancy. Thus there is less mechanical obstruction to the descent of the ovum to the lower portion, and to its becoming engrafted there, whether it is impregnated before or after the descent. But this can be only one factor as a cause, else the cases would be more frequent. The prognosis in these cases is grave, and the risk to the mother is certainly great, but in my opinion there is no class of dangerous cases in midwifery, where prompt, energetic, and judicious management yields better results. The mortality of the children is unavoidably large. As to treatment, the only rule of practice that can be laid down for all cases, after labor has commenced, is to deliver the quickest by any method that is safe, and the method that best fulfils these conditions in the large majority of cases is version by the old method. If the os is not sufficiently dilated to admit of the safe introduction of the hand into the uterus, the vagina and os should be efficiently tamponed until it is, and it may be borne in mind that it is not necessary that it should be fully dilated, and that it can be forcibly dilated by the hand safely, more speedily, and at an earlier period, because they are pluriparous cases, and because of the relaxing effect of the hemorrhage. The objection to the other methods of version is, that while you are effecting it, the hemorrhage is not controlled, and if you fail, you have temporized, and put your patient in greater jeopardy; whereas by this method the presence of the arm in the os effectually controls the hemorrhage while you are making the attempt, even if there is delay in accomplishing the version. Exhaustion of the patient need not necessarily delay the attempt, for the patient can be rapidly stimulated while it is going on. In some cases of vertex presentations of the child accompanying the placenta previa, especially if it is marginal, and the hemorrhage does not threaten immediate danger, resort may be had to puncturing the membranes, and ergot used, hypodermically by preference. In shoulder presentations, neither should be practised, of course, but preparations be made at once for version. The single instance of death among these cases, attributable to the hemorrhage, illustrates well the danger of delaying delivery. This was a consultation case, and when I was called I found that blood was constantly

leaking from the vagina by the side of the tampon, and the patient already in a state of collapse, in a semi-conscious state, with a cold, clammy perspiration; a small, thready pulse; pale, colorless countenance; labored breathing; and very feeble labor pains. The only hope for her was in stimulation and immediate delivery. Alcoholic stimulants, with quinine and ammonia, were administered freely, and soon I removed the tampon, and introducing my hand into the vagina, I found a central placenta previa, with the os fully dilated. Without withdrawing the hand, I crowded the placenta to one side, and found a shoulder presentation of the child, which had not been detected before; then pushing the hand into the uterus, I turned by the foot and delivered without difficulty. There was no hemorrhage after this, for the simple reason that she had no blood to lose. The system failed to respond to stimulation, and she died fourteen hours after. If means had been at hand for transfusion, she might possibly have been saved after the delivery. The women in attendance told me that she had strong, propulsive pains the day before, and probably could have been delivered then, if the attempt had been made. All the circumstances were unfavorable for the patient, for she lived four miles away from physicians, and the one employed was an old man, past his efficiency, and worn out by two days and nights of anxiety, watching, and loss of rest.

Funis Presentations.—In the two cases of this accident at full term, one was a natural labor, and the other was a forceps delivery. Both children were still-born. The cord was not replaced in either case. There was one other which was premature, and the fetus dead from other causes than the prolapse of the funis.

Face Presentations.—There were two of these full face, and six forehead; eight altogether, or 1 in 119 of all deliveries, except abortions. The sad result of the *second* case, which was a full face presentation, with the chin posteriorly, and at full term, in connection with a better knowledge of the mechanism of labor, has convinced me that, contrary to the advice of some late authors, all such cases should be treated by version while the head is at the superior strait, and when it can be effected. It is probably safe to trust all chin anterior, and premature chin posterior cases to Nature and the forceps, but it seems to me that the uncertainty of full-term chin posterior

positions rotating to the front is so great that we should not take the risk. It will be seen that in the above cases all the chin posterior ones that resulted favorably were either of premature or small children, and even these, with one exception, were delivered with instruments.

Complex Presentations.—There was only one of these and this was of the head, one foot and the funis. This was a consultation case, and when I made my visit all these parts were well down in the cavity of the pelvis, and there was no pulsation in the cord. Chloroform was administered, and I first attempted to perform podalic version by traction with the foot, but failing in this I applied the forceps to the head and delivered without difficulty, the foot receding as the head advanced. The child was still-born.

Positions.—With regard to positions of vertex presentations, the numbering is that generally adopted now; the *first* being that in which the head is in the right oblique diameter (the diameters being named right and left according to the sacro-iliac synchondrosis from which they spring), with the occiput forwards; the *second*, the head in the left oblique with the occiput forwards; the *third*, the head in the right oblique with the occiput backwards; the *fourth*, the head in the left oblique with the occiput backwards. It will be seen that nearly 75 per cent were in the first position. The next greatest number, and over 20 per cent, were in the second; while a very small and nearly equal number were in the third and fourth. It must be taken into account, however, that these are observations in private practice, where they are not usually made as early in the labor as in lying-in hospitals, and rotation from a posterior to an anterior position may have occurred in a portion of the cases before examinations. Besides, there were doubtless errors of diagnosis in the early years of my practice. Yet I cannot resist the conviction that Naegele was in error when he claimed that the third position is more frequent than the second. I believe the reverse to be the fact, and I think this is the conclusion the majority of other observers at the present day are coming to.

The causes of the great frequency of the first position seem to me to be mechanical in connection with the reflex fetal movements, the same as control the presentations, with the exception that gravity has even less, if it has anything at all to

do with this correct and final adjustment of the fetus to the cavity of the uterus prior to the act of parturition. To explain fully the whole process by which this adjustment is attained, it is necessary to go back to the early period of pregnancy. It is generally admitted that the presence of the rectum, frequently distended in the left side of the pelvis, crowds the enlarging uterus to the right side of the median line, and this is a wise provision to lessen the pressure upon the rectum that would tend to paralyze its action, and to lessen the liability to retroversion of the uterus occurring at about the end of the third month, which would happen oftener than it does, if the uterus enlarged upwards directly in the median line, meeting as it would with the promontory of the sacrum, an obstacle that would likely crowd the fundus downwards and backwards into the hollow of the sacrum. Then, as the uterus enlarges still more and rises up out of the true pelvis, its direction to the right is continued and maintained by the projection of the spinal column forward into the abdominal cavity. After this, its enlargement is more readily in a direction upwards, forwards, and to the left, because of the unyielding nature of the structures behind and to the right of it, and this direction is further favored by the distensible anterior walls of the abdomen, and greater unoccupied space to the left of the spinal column, the right being occupied by the partially enlarged uterus and the liver. The fetus begins to assume a curved form in its early embryonic state; the two extremities of the spinal column, which is first developed, the cephalic and caudal, bending forwards towards each other. As the development proceeds and the limbs are formed, these are flexed upon the anterior surface of the body, and by the time that the fetus nearly fills the cavity of the uterus it is strongly flexed, and the spinal column is arched like a bow. Now, by its reflex movements, it adapts itself to the cavity it nearly fills, and the result is simply the fulfilment of the mechanical law, that the form of the body and of the cavity which it fills must correspond. The enlargement of the cavity of the uterus being, as we have seen, forwards and to the left, the most prominent portion of the fetus, that is, the arched back, must follow this direction at the period in which it is about to nearly fill the cavity, and this brings it forwards and to the left, and the occiput in the same direction. Thus, when the

second stage of labor begins, the long diameter of the head is ready to engage in the longest diameter of the superior strait of the pelvis. The variations from this are mostly in the case of premature deliveries, and of a dead fetus, for the obvious reasons that in the former the size of the fetus and of the cavity are not so nearly equal, thus allowing movements of the fetus in various directions; and in the latter the position, whatever it may be, is accidental, and doubtless in some instances effected by external causes.

The same law holds good with reference to breech presentations, and the explanation is the same. Here, too, the first position, or that with the back forwards and to the left, is the most frequent. This brings the longest diameter of the breech into the left oblique diameter, but the longest diameter of the head into the right oblique, which is the most favorable for the most difficult part of the delivery, that of the head.

Twin Cases.—The proportion of these is 1 in 79½. The average stated by Playfair is 1 in 87; by Leishman 1 in 75 to 80. As regards the sex of the children, it will be seen that of the three classes, that is, where both were males, both females, and those of opposite sex, the number was just equal, or for the total an equal number of each sex. In half of the cases the presentations were vertex of one child and breech of the other; both vertex in four of the cases; and one each of both breech, and a vertex of one child and shoulder of the other.

Adherent Placenta.—There are four of these cases recorded. Possibly there might not have been as many as this if I had practised Credé's method of expression of the placenta formerly as frequently as I do now. Very likely also the frequency of hour-glass contractions of the uterus may be reduced by this practice.

Post-partum Hemorrhage.—There are eighteen of these cases. Only those were recorded in which there was a decided impression upon the vital powers. The means resorted to for the prevention and arrest of the hemorrhage were such as are usually employed; firm pressure upon the fundus of the uterus, commenced as soon as the head is born, and continued until firm contraction is secured, after the delivery of the placenta; cold applications suddenly to the abdomen and cold to the vulva; a full dose of ergot just before the birth of the child if hemorrhage is anticipated; ice applied to the os

uteri; elevation of the foot of the bed; and firm application of the binder. I have never had occasion to resort to intra-uterine injections of any kind. In two instances alarming hemorrhage was quickly controlled by the introduction of a large naked icicle into the vagina and up to the os. In only one case was death of the mother in any degree attributable to this cause, and several other causes operated with this, and contributed more largely than this to the result. I believe that if obstetricians would invariably, persistently, and methodically resort to the well-known means of prevention, among which I would include Credé's method of delivery of the placenta by expression and letting the cord alone, fatal results would be exceedingly rare.

Rupture of the Perineum.—There were thirteen of these accidents, all in primiparæ. Twelve of these were partial or did not involve the sphincter ani. The remaining one was complete and extended entirely through the sphincter. Whether this is a large or small proportionate number I am unable to say, having no statistics at hand. In eleven of the cases the delivery was with the forceps, but I am not prepared to admit that their use caused this result, nor yet to positively deny it. Partial rupture would have been likely to occur in these cases even if the forceps had not been used. If their use did contribute to the rupture, it is a fair question whether this misfortune is not more than compensated for by the greater chance afforded the child for its life, endangered as it is by the long delay, and compression of the head in the pelvis.

In this connection I may say that the treatment in all these cases of partial rupture was postural, and strict attention to cleanliness; the use of carbolic solutions, and longer confinement to bed than usual. All healed satisfactorily except that in one instance three cicatricial bands were left, crossing the lower extremity of the vagina diagonally, which delayed the progress of the head in the next labor, and had to be cut with a bistoury. In subsequent labors there was no difficulty. So I believe that the practice recently advocated in some quarters, of immediately uniting the rupture in all cases, is not necessary. In hospital practice, where the physicians are more surgeons than obstetricians, and where the patients are more under control, it is more practicable than in private practice. The woman with the complete rupture has often been advised to have an operation, but would not submit.

Puerperal Eclampsia.—There were twelve of these cases, or 1 in 79½, of which five were in consultation. Three, or one-fourth, were in connection with illegitimate births. Only four are recorded as being edematous subjects. Unfortunately a record was not kept of examinations of the urine. A study of these cases leads me to the conclusion that too great prominence is given to albuminuria as a cause of these convulsions. The discovery that there is in many cases an intimate relationship between the two conditions has carried authors to the extreme. It has been estimated that albumen exists in the urine in more than twenty per cent of pregnant women, and, in the case of primiparæ, in considerably greater proportion than this. In these statistics the ratio of eclampsia cases, including the five seen in consultation, to all labors is only a little over one per cent, leaving a proportion of about 20 to 1 in which convulsions do not occur with albuminuria. Besides, here the proportion of eclampsia cases to all labors is much larger than that usually given. Albuminuria is also often connected with specific diseases, scarlatina and diphtheria for example, without convulsions, and among children, who are peculiarly susceptible to these nervous disorders. Various forms of functional disturbance of the nervous system are often associated with pregnancy. The nervous centres at this period are in a state of exalted sensibility and irritability. The emotional element preponderates, and causes acting upon the emotions intensify this element in some cases to that pitch that control and balance are lost and convulsions ensue. This will explain eclampsia in illegitimate pregnancies in the absence of other causes. The shame, the fear of exposure, the unremitting anxiety, the solitary brooding, strain beyond endurance the nervous centres with their supply of nerve-force already diminished by the demands of pregnancy.

Induction of Premature Labor.—I have had occasion to resort to this operation but twice, and this was for contracted pelvis, and both times in the same patient. No cases of vomiting in pregnancy have occurred in my practice so severe or uncontrollable as to threaten life and require this last resort. No other cases of contracted pelvis in which craniotomy was performed, except this one, were known before labor commenced. The parturient history of this woman is interesting to prove that "meddlesome midwifery" may sometimes accomplish valuable

results. She is a healthy, strong, and robust woman, and at the time of her first parturition, which was at the full period of gestation, she was thirty-three years of age. I was called in consultation with two physicians after she had been in labor over two days. They had tried to deliver her with the forceps but failed. I also tried and failed. We then performed craniotomy, but were obliged to use the fillet under the axilla to deliver the body. The child weighed about eight pounds. She was then urgently advised to have premature labor induced if she became pregnant again. She did not heed the advice, but went on to full term next time, and employed another physician who delivered her by craniotomy after failing with the forceps as before. She became pregnant the third time, and consulted still another and the fifth physician. He persuaded her to have labor induced at about the seventh month, and began the operation; but before it was concluded, I was called in consultation. We found a breech presentation of the child. It was delivered without mutilation, but still-born. In her fourth pregnancy she consulted me, and at about the seventh month, I dilated the os uteri with tents, and finding a shoulder presentation, put her under the influence of chloroform, performed podalic version, and delivered her of a living child. Its weight was about five pounds. She became pregnant the fifth time and consulted the physician who performed craniotomy at her second labor. He also induced premature labor at about the same period as it had been done before, found a vertex presentation, and delivered a living child. To recapitulate, she has been delivered of five children in as many pregnancies; the two first times by craniotomy, after failure with the forceps; the three last times by the induction of premature labor at about the seventh month. The first of these three last children presented with the breech and was still-born; the next with the shoulder, and was delivered living by version; and the third with the vertex, and was delivered living. She and her two children are now living and in good health. She has given five different physicians the opportunity to operate either by craniotomy, version, induction of premature labor, the forceps, or the fillet, in fact, to practise nearly all of operative midwifery.

Forceps.—These were used in sixty-four cases, or in the proportion of about 1 to 15 labors, excluding abortions. In

the first five hundred cases the ratio in round numbers was 1 to 30; in the last five hundred 1 to 10; and in the last one hundred 1 to 5. It will be concluded that I am in favor of the frequent use of the forceps, and I believe that the character of the cases as they average in practice will warrant this, both in the interests of the mother and child. The doctrine still taught in some standard works on midwifery, that the blades of the forceps should be applied to the sides of the child's head, and that therefore it is necessary that the actual position of the head be made out with perfect certainty, and that we must first be sure with which of the cranial positions we have to deal before we even take the instrument into our hands, is erroneous and mischievous, and ought to be expunged from our text-books. This bugbear has deterred many young practitioners from the use of this valuable resource of saving life and alleviating pain. The suffering mother has a right to demand of us the use of the forceps, as she often does, where she has previously experienced their harmless aid. We mock her when we urge her to exert herself to the utmost to complete the labor, and sit calmly by and make no effort ourselves.

Weight of Children.—The statistics do not show as great a difference in the average weight of males and females as is usually supposed, it being only .03 of a pound in favor of the males.

In conclusion, I may say that I apply the binder in all cases after delivery, and believe there are sound reasons for the practice. It should be evenly and firmly applied, and well down over the hips. There is as good reason for its application as after the operation of paracentesis abdominis. It gives support, and acts as a splint for the walls of the abdomen, and for the pelvic joints relaxed by gestation and strained by parturition. It acts as a preventive of secondary post-partum hemorrhage, occurring sometimes several hours after delivery. It restores the form, and, lastly, it is agreeable to the patient.

I apply but one ligature to the cord in single births. This is all that is necessary, and gives us a saving of time. The bleeding through the cord lessens the bulk of the placenta, and thus promotes contraction of the uterus and easier expulsion.

BURLINGTON, VT., February, 1879.