On Twins, or Plural Births
The Process of Reproduction, although sufficiently obscure to tempt
and excite further investigation, has
been elucidated to an extent which
has deprived it of much of its former
mystery and made plain what, at
one time, seemed to be beyond human
comprehension. But while research
has been rewarded by a disclosure of
the phenomena of reproduction and
while inductive reasoning has evolved
truths which further investigation
and to confirm, yet the process itself
is shrouded in obscurity which we may
not hope to clear away. It is the re-
sult of an influence too subtle for hu-
man comprehension; it is one of
those countless emanations of that
Power which "works to secret"
the nature of whose operations "eye
 hath not seen, neither hath it en-
tered into the heart of man to con-
cieve," but the result of which is to
produce not only the liveliest in-
clined and the profoundest admiration,
In the Reproductive Process, as in all the processes of Nature, interruptions sometimes occur and departures from the normal course are not unfrequent. In the following paper we propose to consider an important though not extraordinary deviation from the normal generative process of the human female, and, while the subject is involved in all the steps of Reproduction, it possesses the additional feature which arises from its departure from the ordinary phenomena accompanying that process. We shall, in the first place and briefly, look at the History, Statistic and Theories regarding Plural Birth or, more properly speaking, as far as this paper is concerned, Twins and Secondly, the Anatomy, Physiology, Pathology and Obstetrics.
History.

In plural births the most usual number of children produced is two. Indeed twin births, though not common, are yet too common to be considered extraordinary. For the first recorded instance of twin production we have to go to Sacred History. I refer, of course, to the birth of Esau and Jacob. "And when Rebekah's days were fulfilled, there were twins in her womb." Genesis XXV. 24.

Triplets, or the production of three children at a birth, are much rarer than twins, occurring only at considerable intervals so that an extensive practice may fail to furnish even one instance. Dr. Garthorn observes that "in a very extensive practice of above thirty years both in the county of Rutland and in London I have attended but one labour where three children were born; and personally acquainted with but one lady.
Philosophical Transactions 1784 - p. 351

Philosophical Transactions - p. 353.
after bearing twins twice, was delivered of three children at once and I was never acquainted with any one who produced a great number.

In the town in which I reside a case occurred three years ago. Mother and children did well at the time but the latter all died about the age of three or four months. I was not fortunate enough, however, to be the accoucheur on that occasion. The sisters (residing in the north of England) of a patient of mine, as a primipara, gave birth to triplets and eleven months after presented her husband with twins.

The occurrence of four children at one birth is so rare as to be beyond the possibility of an exact average. A few cases are recorded by Dr. Gartshore. One occurred "in March 1673 in which three sons and one daughter were all born alive, busy children and perfect in every part which lived twenty-four hours and then died."
(1) Philosophical Transactions, 1787, p. 355.

(2) Campbell's Midwifery, p. 291.
Dr. Hamilton informs us that at Penny-quick near Edinburgh a woman was delivered of five children, and that some of these survived for several years. After mentioning another case which came under his observation in Edinburgh, he remarks that these are the only cases of quadruplets or any larger number he had ever heard of as born in Scotland in his memory.

Five children at a birth are considered by Haller to occur at the average of one in a million. His computation is not likely to be called in question, and the statement whether perfect accurate or not is a pretty good figure of speech to express the extreme rarity of the occurrence. Gartshore refers to two cases which occurred, one in Upper Saxony, the other near Prague in Bohemia. Chambrow relates an instance of the birth of five children at one accouchment at which he was present.
Instances, I believe, have been recorded where six or more children were brought forth at one time. But for the relation of such occurrences, we are mainly indebted to newspapers and other sources of information, the trustworthiness of which is certainly not above suspicion. I do not assign any limit to the fertility of man in the field of reproduction, but for our present purpose the number of children at one birth already mentioned will, in most cases, be considered quite sufficient by the parents as well as by the accompanying, and the mythical legends of past ages may be consigned to oblivion. If our forefathers, with simplicity almost sublime in its intensity, gave credence to them, we are not called on to rely on them. And though that simplicity may be conceived it is, I hope, not shared by the more forward intellect of modern times.
Statistics.

In further discussing the subject of twin births, the first task we have to undertake is to discover with exactitude, if possible, the frequency with which this departure from the natural order of things exists amongst the phenomena of nature. This is by no means so easy as at first sight it may appear, and the fact that there is no lack of statistics on the subject does not lessen the difficulty. The statistics dealing with the frequency of the occurrence of twins and vast indeed are the conclusions drawn from them or seen in the researches of different authors and both various and contradictory. This diversity of opinion upon a matter which at first sight seems simple, may be accounted for perhaps by the fact that most observers have not employed large enough numbers upon which to base their conclusions. Thus, according to the
Statistics of some, the average of
Twin cases is one in fifty; while according to the observations
of others it is only one in one hundred
and thirty-two. Between these extremes
the average ranges more or less
and is now pretty generally accepted
as being about one in eight.

When I first turned my attention
to this subject (a number of years ago,) w
with the view of writing the present
paper, out of my first two hundred
accouchments I had four Twin
cases, and three out of the four oc
curred in the first hundred and
thirty-five, thus giving one, out of
the two hundred, an average of
one in fifty. As time rolled on, how-
ever, and my number of cases
increased, I found that my average
was very much less and now
does not surpass, nor even reach
the accepted standard.

May I be allowed here to join my
experiences about another and al-
Together different Class of Cases.

Fifteen years ago I attended three cases of Placenta Praevia within a fortnight. Since that time I have seen only two cases of that dangerous abnormality; one, nine years ago and the other six.

Twelve years ago I attended two cases of Periperal Convulsions occurring within the days of each other and never saw another case till March of last year.

I am aware that I am digressing but have introduced my experience in these cases as illustrating the errors that may arise from hasty drawn conclusions and the fallacy of hasty generalization from insufficient data.

The following table will illustrate the proportion of Plural Births as they have occurred to different observers throughout the world, it exhibits also the disparity which characterizes the data.
<table>
<thead>
<tr>
<th>Location</th>
<th>Physician</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dublin</td>
<td>Clarke</td>
<td>1 in 56</td>
</tr>
<tr>
<td></td>
<td>Collins</td>
<td>1 in 68</td>
</tr>
<tr>
<td>London</td>
<td>Bland</td>
<td>1 in 70</td>
</tr>
<tr>
<td></td>
<td>Conquest</td>
<td>1 in 90</td>
</tr>
<tr>
<td></td>
<td>Ramsbotham</td>
<td>1 in 91</td>
</tr>
<tr>
<td></td>
<td>Denman</td>
<td>1 in 92</td>
</tr>
<tr>
<td>Edinburgh</td>
<td>Simpson</td>
<td>1 in 83</td>
</tr>
<tr>
<td>Glasgow</td>
<td>Burns</td>
<td>1 in 93</td>
</tr>
<tr>
<td>Paris</td>
<td>Lachapelle</td>
<td>1 in 83</td>
</tr>
<tr>
<td></td>
<td>Boivin</td>
<td>1 in 132</td>
</tr>
<tr>
<td>Vienna</td>
<td>Boer</td>
<td>1 in 70</td>
</tr>
<tr>
<td>Wurtzburg</td>
<td>Nichte</td>
<td>1 in 83</td>
</tr>
</tbody>
</table>

Of course, in the foregoing table, there are many important regions of the world not represented, and to strike the average occurrence of twins from it would be fallacious. But as we have already stated and as pretty well borne out by the above table, it is now a generally adopted belief that the proportion of twin births throughout the world is about one in every eighty.
Dr. Churchill in his Theory and Practice of Midwifery (p. 484) furnishes us with elaborate statistics to show the frequency with which twins occur in practice of British, French and German accouchers.

The result of his investigations we present in tabular form.

<table>
<thead>
<tr>
<th>Practice</th>
<th>No. of Cases</th>
<th>Twins</th>
</tr>
</thead>
<tbody>
<tr>
<td>British</td>
<td>233,585</td>
<td>3314</td>
</tr>
<tr>
<td>French</td>
<td>39,409</td>
<td>3360</td>
</tr>
<tr>
<td>German</td>
<td>369,580</td>
<td>4239</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>642,074</strong></td>
<td><strong>4889</strong></td>
</tr>
</tbody>
</table>

Dr. Thus

- British: 1 in 40½
- French: 1 in 108
- German: 1 in 87

The proportional number of women giving birth to twins varies in different regions, as also in our own country.

Thus:

- In Scotland the proportion is 1 in every 95
- In England: 1 in 92
- In Ireland: 1 in 62
Simpson, Obstetrical Works p. 820
In plural, as in ordinary births, the female sex predominates. All statistical records in hand yet seem attest this fact. In twin births there is most frequently a child of each sex present, next two female children and last two males.

The analysis made by Dr. Simpson of the published returns of the Edinburgh, London, and Dublin Hospitals corroborate what is here stated.

<table>
<thead>
<tr>
<th></th>
<th>Two Males</th>
<th>Two Females</th>
<th>Male Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edinburgh</td>
<td>16</td>
<td>17</td>
<td>13</td>
<td>46</td>
</tr>
<tr>
<td>Dublin (Clarke)</td>
<td>47</td>
<td>66</td>
<td>71</td>
<td>184</td>
</tr>
<tr>
<td>&quot; (Collins)</td>
<td>43</td>
<td>67</td>
<td>100</td>
<td>240</td>
</tr>
<tr>
<td>London Maternity</td>
<td>93</td>
<td>111</td>
<td>114</td>
<td>318</td>
</tr>
<tr>
<td></td>
<td>229</td>
<td>261</td>
<td>298</td>
<td>788</td>
</tr>
</tbody>
</table>

The proportion in which the different types of twins occurred to the whole 59,178 cases of labour which took place is as follows:

- Male & Female Twins once in every 199 labours
- Two Female Twins " 2.26 "
- Two Male Twins " 2.58 "
The fact that twins are most frequent of opposite sexes and that twin females are more frequent than twin males is further corroborated by the statistics obtained by Dr. Simpson during the years in which he presided over the Edinburgh Maternity Hospital, and more by the data furnished by Dr. Collins which are here present.

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
<th>Male:Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarke</td>
<td>47</td>
<td>68</td>
<td>41</td>
<td>186</td>
</tr>
<tr>
<td>Collins</td>
<td>73</td>
<td>64</td>
<td>94</td>
<td>234</td>
</tr>
<tr>
<td>Lewis</td>
<td>11</td>
<td>11</td>
<td>11</td>
<td>33</td>
</tr>
<tr>
<td>Pamborough</td>
<td>141</td>
<td>183</td>
<td>182</td>
<td>536</td>
</tr>
<tr>
<td></td>
<td>302</td>
<td>329</td>
<td>361</td>
<td>992</td>
</tr>
</tbody>
</table>

My experience of twins has been so limited that no conclusions can be drawn from it, but may here state that out of nine cases there were five in which one of each sex was present, two in which both were females, and the same number in which both were males.
Theories

Into this portion of our subject it is not our purpose fully to enter.

Several theories have been produced with the view of accounting for the occurrence of plural births; but the obscurity of the subject does not appear to have been diminished either by their number or ingenuity.

It has been supposed that climate and the state of civilization to which a country has advanced exert an influence on the numerical production of the human female.

It is conceded that twins occur more frequently in one country than another. In Greece and for instance, the occurrence of twins is said to be rare, while in Chili, Egypt, and Arabia the event is said to be of comparatively frequent occurrence. In this country too, according to Dernman, "of the women admitted into the Middlesex Hospital, London, of 86,360 births there were only ninety-three cases of twins". But in the accounts published
by Dr. Clarke of Dublin the number of twins was in greater proportion to the births and there were several examples of triplets.

If climate causes this influence, we shall be glad to know in what important characteristic the climate of Dublin differs from that of London.

How far does civilization affect the phenomenon of twin-bearing? Dunmow and Ranchotham compare the condition of the lower animals with the human female in support of this contention. "The wood pigeon lays fewer eggs than the domestic dove and the sow, in a state of nature, brings forth fewer young than when domesticated in Dublin than so much more advanced in civilization than London; besides, is it not the fact that plural births occur more frequently among women in the lower ranks of life? This, I think, will be admitted by scientific authorities, as well as being a matter of common observation."
Again, in Maternity Hospitals, where as a rule and to be found more in the poor and needy we have a fair field for comparison and I believe it has been proved by the records of such institutions that plural births are of greater frequency than in private practice.

The production of twins has also been attributed to the influence of heredity. This, however, must rather be included in the category of well-established fact than theory and does not carry us far in the direction of solving the problem. It neither operates as a cause nor does it afford an explanation of the presence of twins in the uterus, but numerous instances have been recorded by trustworthy authors and most who have paid any attention to the subject must have observed cases which bear out the statement that "premature natural fecundity is to a certain extent hereditary."
Obstetrical works Cobb p. 318.
Sir James Simpson says, "The tendency to the production of twins in the human subject is sometimes so marked in particular families as to entitle it to be considered a hereditary peculiarity." He mentions a family in which different branches of which twelve pairs of twins have been born within three generations.

In my own practice, during last summer, I attended a farmer's wife in her 19th confinement, and her labour being safe, over, had to congratulate her on the birth of her twenty-first child, she having had twins on two previous occasions.

She was one of a family in which the mother had seven births to twins.

It has also been said that "some seasons are more prolific than others." With that statement we may agree, and yet deny to it the honour of being a factor in the production of twins. I do not know whether it happens to all medical men or not.
but the "coming in runs" of certain particular cases has so frequently happened to myself, that I have not ceased to regard it with surprise. For instance, my cases of Purpural Convulsions and Placenta Praevia (p. 29) in the absence of statistical evidence, on this point I think we are entitled to withhold our assent to a theory which, so far as human knowledge at present reaches, may be merely a supposition.

Other theories have been promulgated by different observers, but we incline to believe that the cause of Plural Births rests mainly with the female parent. We do not profess to account for the condition in the ovaries from which re satellites, but in those organs we do believe the primary cause of Plural Births to be found. On this point we shall probably have something further to say when we come to consider the Physiology of Plural Births.
As the mother, in the subject—under our consideration, bears such an important part we may here touch upon the influence of her age on the production of twins. For the elucidation of this point we are indebted to the researches of Dr. Matthews Duncan, and from elaborate investigations he deduces the following laws.

1. The largest number of twins is produced by women of from 25 to 29 years of age; and on each side of this climax of fertility in twins there is a gradually increasing diminution in their number as ages diminish on the one side & increases on the other.

2. Twins are not regularly distributed among births generally; their production therefore is not subjected to the same laws as govern ordinary fertility.

3. The mean age of twin-bearing mothers is greater than that of mothers generally.

4. Twins increase in frequency as mothers become older.
(5) Newly-married women are more likely to have twins the older they are.
(6) While the fecundity of the average individual increases with age till 25 is reached, and then gradually diminishes, there is some probability that the opposite is true, so far as regards twins alone, fertility in twins being greatest when fecundity is least and vice versa.
(7) The actual number of twins born of a mass of women in different pregnancies decreases as the number of the pregnancy increases.
(8) The number of twins relatively to the number of children born in different pregnancies increases with the number of the pregnancy. In other words, a woman is more likely to have twins in each succeeding pregnancy than in the former pregnancy.
(9) In an individual twin-bearing is, of course, a sign of high fertility at the time. It also, in a mass of women, shows a high amount of fertility at least till the time of the birth of the twins.
(10) It is probable, though not proved that twins bearing women have larger families than women uniformly unparous.

History is somewhat barren, statistics are to some extent, misleading and theories, though affording a wide field for speculative imagination are not always satisfactory. We therefore cheerfully quit that part of our subject where we encounter so much of speculative philosophy and enter upon the tangible and the real. The cause of plural births is partly beyond our reach, its effects “our hands may handle.” The cause, as we think lies, not so much in race, climate, civilization, or the ages of the parents as in the functional activity of the ovaries. It is therefore to a consideration of these bodies that we now turn our attention. In doing so we do not mind going into details but will find many a brief outline of the female organs of generation more immediately connected with our subject.
Anatomy.

I. The Ovaries and Ova.

The ovaries are two somewhat flattened oval bodies, lying, one on each side, at the back of the broad ligament of the uterus and enveloped by its posterior membranous layer. The ovary consists essentially in man or rather woman of a fibrous stroma, an outer epithelial covering, and the embedded Graafian follicles with the ova. Three ova and the essential contribution of the female towards the formation of a new being. At certain periods an increased vitality takes place in the ovary. The Graafian follicles with their included ova are in various stages of development and their degree of maturity is in proportion to their proximity to the surface of the ovary. When increased functional activity occurs in the ovary, a Graafian follicle begins to enlarge and as it does so pushes its way to the circumference. It goes on increasing in size while the covering becomes more and more thinned. The coils...
If the ovary give way before its advance thus forming a projection on its surface increased in the size of the follicle continues until at length both its own covering and that of the ovary give way rupture occurs and the ovum escapes. When this happens a process of absorption takes place in the follicle and that peculiar punctated structure called the Corpus Luteum is formed.

The ovum usually proceeds along the fallopian tube into the uterus. If in any part of its course it meets with the Spermatogonia of the male it becomes fertilized and retained in the uterus and developed into a mature foetus. If, on the other hand, no contact with the Spermatogonia occurs the ovum is discharged or rents of time having accomplished nothing.

Such is a very superficial sketch of the leading phenomena accompanying the formation and liberation of an ovum. We have now to inquire into the conditions which result in those structures when the product of the womb is multiplied.
1. The relation of the number of children produced at a birth to the ovary. Twins may proceed from one ovary; one Graafian follicle containing two ova which may both be fertilized and thus twins result; or each ovary may furnish the elements of each foetus. When there are more than two children one ovary must supply a proportionally larger number of ova, as in no instance has an excess of ovaries been observed.

2. A plurality of children may occur when there is only one ovary present. This statement is confirmed by a case described by D. Granville in the Philosophical Transactions for 1818. He records his dissection of the genital organs of a woman who had borne eleven children and had died after giving birth to twins. The left half of the uterus was entirely absent. The left Fallopian tube and ovary did not exist. The right half of uterus with the Fallopian tube and ovary which belonged to it, was alone developed.
Philosophical Transactions 1784 p. 236.

Blundell's Principles of Obstetny. page 130
The result of experiments upon the lower animals further confirms this. John Hunter extracted an ovary from a sow which farrowed eight times after the operation and produced seventy-five pigs.

3. More than one ovum may be liberated from the ovary at the same time, each accompanied by the same phenomena which attend the liberation of one. Two or more ova may be maturated at the same period, may escape from the ovary, and enter the uterus together where each may be maintained distinct from the other. Dr. Blundell mentions a case bearing on this point. He says "where three and two follicles, two vesicles are in general excited, and two lutea become formed in a woman, from whom a preparation of this kind, in my collection, was taken, there were twins and you may observe a corpus luteum in each ovary." William Hunter too, in his Anatomy of the Gravid Uterus p. 14 says "I have had opportunities of examining the
Ovaries with Case in. Several cases of
broons and always found two corpora lutea.
In one of these cases there were two dis-
tinct corpora lutea in one ovary.
In others there was a distinct corpora lutea
in each ovary.

While the number of corpora lutea generally
 correspond to the number of children pro-
duced, this is not always so.

4. Two or more may exist in one
graafian follicle and thus a plurality of
children may occasion no plurality of
corpora lutea.

Dr. Montgomery says, "I have uncontestible
proof that two broons are occasionally
contained in one vesicle and that, upon
the birth of broons only one corpus luteum
may exist in the ovary." Some years since
a woman died in Sir Patrick Dun's Hospi-
tal, after giving birth to broons of six months
male and female and on examination by
myself one large corpus luteum only was
found in one ovary and none in
the left."

While the fact that more than one ovum
may exist in the same Graafian follicle, has been ascertained, we are not yet sure of the manner in which this is accomplished. It may be that in the early stage of granular aggregation two or more centres may exist in such close proximity that one receives includes them all. Such an explanation is at least probable and does not impair our credibility. Such a demand as that other theory which attributes the plurality of ova within one follicle to a spontaneous division of the ovum into one or more segments.

II. Fallopian Tubes.

There are two canals or ducts which serve to convey the ovum into the uterus. They are about four inches in length and proceed from the upper angle of the uterus. Their free extremities expand into fringed-like processes or fimbriae. It is by these fimbriae that a connection between the tube and the ovary is established. When the ovum escapes from the ovary, it is seized by the fimbriate extremity of the Fallopian tube along which it travels.
and, after several (ten or more) reaches the uterus, invested by a new membrane—the chorion—which it has obtained in its passage.

In the case of plural births each tube will be called into service if the ovum is contributed by both ovaries. And if two or more ovum are expelled at the same time from the ovary we must suppose that the embryo of the fimbriae will include all together. An irregular action of the fimbriae of the Fallopian tube has been thought to account for an anomaly sometimes met with, viz., the corpus luteum being found on the ovary of the opposite side. To account for this Dr. Renard thinks it might be assumed that by some irregular action the fimbriae of the opposite ovary were so altered in position as to cleave the ovary that did not properly correspond to it.

III. Uterus.

This is a hollow muscular organ which in the case of pregnancy receives
the ovum, retains and supports it during the development of the fetus and expels it at the time of parturition. Its average dimensions are about three inches in length, two in breadth at its upper and wider part, and nearly an inch in thickness. It is usually described as possessing a fundus, body, and neck. When impregnation of an ovum occurs, a series of changes takes place within the uterus which prepares it for the future residence of the approaching germ. Its physiological structure as well as its physiological becomes altered. It increases in size, becomes more vascular, and upon its internal surface a soft pulpy secretion appears which is recognized as the decidua. The physiological condition of the uterus is not affected by the presence of a plurality of children, at least that only exists a difference of degree, depending upon the necessary requirements which an increase in
The number of its occupants cannot fail to give rise to the entire physiological condition of the organ is heightened; the extent and reflections of its decidua membrae and increased and altered; and it has to accommodate a larger placental surface.

Its physical conditions, however, are influenced by the presence of more than one child. Its shape and dimensions participate in the number, size and position of its occupants. It is proportionately larger than in single conceptions and generally is more flattened and broad.

In Chorion and Amnion, and the membranes of the Fœtus. The Chorion is the external membrane and is formed earliest. It makes its appearance while the ovum travels along the Fallopian tube and invests it before it reaches the uterus. Before the formation of the Amnion it consists simply of the zona pellucida or vitelline membrane. The inner surface of this
membrane is smooth and glistening. While externally it is covered with villi which help to fix the ovum in the uterine cavity and is in contact with the decidual membrane of that organ. The Amnion immediately surrounds the embryo. It is formed in the process of development after the ovum has reached the uterus. In the earlier period of gestation it enfolds the embryo closely, but as time advances a fluid is secreted which distends the sac. This fluid is the Liquor Amnii in which, during the later months of the pregnancy the child is bathed.

We have not entered upon the intricacies of the formation of the embryonic membranes but the foregoing reference (brief and imperfect though it be) to these membranes as they appear in an ordinary case of single birth will prepare us to consider their dispositions in the event of a plurality of children.
1. A distinct set of membranes may exist for each child, and each may possess a separate placenta. This may be regarded as the normal condition in a case of twins. It is only a repetition of the phenomenon which marks the presence of one foetus in utero—the anatomical history and relations of the subject—and simply multiplied. We have only to imagine that two ova descend at the same time or nearly at the same time, through the Fallopian tubes or tubes, that no contact takes place between them, that each enters the uterus invested by its chorion and adheres or becomes imbedded in a different portion of the decidua membrane. There each becomes developed and matured distinct from and independent of the other.

While this is theoretically the normal anatomical history of plural births, yet the actual occurrence of these conditions is not at all frequent. On the
Dewees System of Midwifery p. 546
Contrary to the variety of modifications so great as almost to defy the efforts of observers to reduce it to systematic classification. Dr. Granville in the Philosophical Transactions for 1818 mentions a case in which the placenta and membranes of one child were expelled several days before the same structures of the second had been expelled. It is to remember that in those cases of supposed superfoetation in which children were born at different intervals, the very fact of each possessing its placenta and membranes distinct and complete was one of the evidences which led to the erroneous conclusion as to the doctrine of their production.

2. The chorion may enclose more than one child while the amnion may be possessed separately by each. This disposition of the membranes sometimes exists and is informed by Dr. Elliotson also refers to this condition in his "Human Physiology," p. 196.
Medical Gazette p. 841.
3. One set of membranes may enclose more than one child.

In this instance, the chorion and amnion and present and in the case which they enclosed two or more children and found floating in the same liquor amnii. Dr. Ramelston in his Obstetrical Medicine refers to some cases which illustrate this condition of common membranes.

4. The children in utero may not possess the membranes alike.

Several instances are on record illustrating the want of uniform possession of membranes on the part of the children. Dr. Davies mentions a case of triplets in which he observed that the first two children were apparently contained in the same bag or set of membranes. That no apparent membranous septum existed between the two. The third child was enclosed in its own proper cavity. In the Medical Gazette p. 384, Mr. Dodd relates a case of circumstances of which were almost identical.
V. The Decidua. When the ovum passes from the Fallopian tube into the uterus, it finds the mucous membrane of that organ prepared for its reception. Its vasculariz is increased and there is a soft-pulpy condition of the membrane itself. It is thus thickened, vascular, softened mucous membrane which furnishes the decidua vera in the folds of which the ovum finds a lodgment. The point of attachment between the ovum and the decidua is distinguished as the decidua curoteline. It is important as the site of the placenta. The folds of mucous membrane which enclose the ovum are termed the decidua reflexa.

VI. The Placenta. The villi which cover the chorion become imbedded in the soft tissues of the decidua and derive nutritive material from the circulatory system of the mother. After the formation of the permanent chorion by the extension of the allantois to the inner surface of the egg, the allantoic vessels convey
The nutritive material directly to the embryo. At first the villi from the sole surface of chorion absorb nourishment, but as the ovum enlarges there is a thinning of the reflexa with obliteration of its vessels. At the same time the villi cease to grow over that portion of the chorion in contact with the reflexa, and the whole process of exchange between foetus and mother becomes concentrated at the decidua serotina and here the placenta is developed. It is composed of a fetal and a uterine portion. The former consisting of the vascular villi of the chorion, the latter being that portion of the decidua which receives them. The placenta is a soft-spongy mass of a round or oval shape; its usual diameter is from six to eight inches, its circumference from eighteen to twenty-four and its thickness from one to one-and-a-half inches, and weighs generally about sixteen ounces.

(a) In plural births the placenta may
correspond to the number of children and be distinct from each other. This, like the similar disposition of membranes already mentioned, is the normal condition of parts and the cases referred to as illustrating a separate investiture of membranes show also the possession of the placenta individually and separately.

(6) The placenta may be united at their edges and appear to be one mass. This is most generally the case and were it not for this adhesion of the placenta the most usual arrangements in plenary births would be that which we have just referred to as the normal. In most instances each child enjoys a cavity for itself and its only connexion with its twin-companion is by the adhesion of the placenta.

Generally this adhesion involves no vascular communication between the two organs, it is merely a union at the edges of the substance of each mass. The case of Dr. Davies p. 34.
Churchill's Theory and Practice of Midwifery p. 108

Medical Gazette 1841. p. 442.

Denman's Practice of Midwifery p. 448.
show this, "Though the placenta was in one mass, there was no communication between the placental vessels of the three children."

C. One placenta may exist for two or more children.

This is a comparatively rare occurrence. In the Medical Gazette for June 1841, Mr. Wardleworth relates a case of five children born at one birth in which there was present one enormous placenta.

VIII. Umbilical Cord—This is the connecting link between the fetus and the placenta, and where there is a plurality of children, does not always sustain a normal relation.

In twins occasionally a cross branch passes from the one cord to the other. One cord proceeding from a placenta may divide and supply more than one child.

The cords of two children may be coiled together as to appear like one.
Physiology.

As the result of a survey of the series of phenomena which constitute the reproductive process two leading principles in physiological science have been established.

I. That every living organism has had its origin in a pre-existing organism.

II. That when placed under circumstances favorable to its complete evolution, every germ will develop into the likeness of its parent, drawing into itself and appropriating by its own assimilative and formative operations the nutrient materials supplied to it, and repeating the entire series of phases through which its parent may have passed.

These two truths are illustrated whenever the reproductive process is performed uninterrupted. In plural births there is no arrestment of the process of reproduction; there is simply a plurality of the conditions which develop its exercise. The physiological relations thus multiplied produce
do not differ, as far as regards the principle, from those of a single birth. The impregnation of the ovum - its changes previous to the formation of the embryo, its transformations within the uterus; the development of the embryo; the appearance of the osseous, vascular, nervous, and muscular systems; in short all the stages by which the form becomes the child, and be traced in plural as well as in single births. The vital processes constituting Generation and Development are being carried on at the same time in more than one center.

The nature and influence of the sexual functions in the production of plural births have been the subject of investigation and have been variously estimated. If the pluralis of children is the result of one impregnation - that such may be, and in the case needs no further confirmation than the fact that a pluralis of children have
been produced when sexual intercourse has been established only at distant intervals.

II. May not a second insemination be established?

This proposition introduces the subject of Superfetation which will shortly engage our attention for a little.

III. Does a plurality of children result from the influence of either male or female in particular?

The experiments of John Hunter upon the lower animals show the important agency of the female in regulating the number produced at birth. The subjects of his experiments were two pigs from one of which he removed one ovary and left the other intact. Interviews with the male were permitted to both — the one that was left unhampered produced in all one hundred and sixty-two young, while the other produced only seventy-two.
We have already expressed our belief that in the female parent was to lie found the cause of twin production. This belief is strengthened, if not confirmed, by the fact that

I. A Graafian vesicle may rupture in each ovary at the same time, thus liberating two ova which may both become impregnated.

II. One Graafian vesicle containing two ova may rupture and both become impregnated.

III. A Graafian vesicle containing only one ovum may rupture, but the ovum may possess two germinal centers, both of which may be fertilized.

IV. There may be a double or becornous uterus.

When two distinct and separate ova are fertilized if they arrive at the same time and fix themselves at the same point in the cavity of the uterus they may have a common decidua reflecta the amnion and chorion remaining distinct.
A Graafian vesicle containing two ova may rupture, they then become independent and may be fertilized and thus twins result; and the conditions attending their development may not materially differ from those observed in the development of ova from separate Graafian vesicles. If the ova are embedded in the decidua at sufficient distant points the placenta may be separate and each ovum have its distinct reflexion. If near one another the placenta and often united at their borders. In some cases the two ova may lie so close together that they are encircled by a common reflexion.

When twins are developed from two germinal centres in the same ovum the placenta, chorion and decidua reflexion and common at both. Generally however, each foetus is contained in its own amnion. In the process of development in this case no may have formation of double memban.
The uterus may be divided into cavities by a distinct partition, each may pass its Fallopian tube and ovary and not only, it is said, can the organ become subject to a double gestation but even the fertilisation is possible at different times and the labour may be separated by a pretty long interval. It is probable that no abnormality may be referred to cases quoted as examples of Super gestation. By this term it is meant that a woman already pregnant may conceive a second time before the termination of the first gestation. Among the older authors this theory was pretty generally believed but among more modern writers there has been much diversity of opinion. The cases which have given rise to this theory may be classed under four heads.

1. The expulsion of a blighted ovum along with a fully developed child.
2. Unequal development of two children - one born at the same time.
3 The birth of twins of different colour
4 When the birth of a mulatto child has been succeeded, after a considerable lapse of time, by the birth of another with regard to the first and second class of cases we know that two or more ovum may, at the menstrual period, be fertilized by a single act of coitus. If in such cases development would take place equally in each the result would be a normal case of twins. But if one ovum were arrested in its development and retained until the full period of gestation of the other we have an explanation of the first class of cases. Again it is very rare to find co-twins equally developed. In fact I believe it is more common to find unequal than equal development but this does not in any way support the doctrine of superposition as it may be explained as being due to other and different causes.

In regard to the third class, Buffon's Case of the White Woman giving birth
t. twins, one white and the other black, is generally recalled. Another case was recorded by M. de Boillen in 1821 of a negro wife who brought forth a negro and mulatto child, and who confessed that she had admitted the embrace of a negro and of a white man the same evening.

In those cases we admit that there were two distinct impregnations, but the intercourse with the male took place in both instances, at very short intervals, and knowing what we do of the rapidity of Graafian vesicles and the consequent discharge of ovum this is not denied. If such cases occurred with an interval of four or five months between the birth of the children, the case would be altered, but I am not aware of any such on record.

We now come to the fourth class of cases which are most difficult of explanation. "It has been supposed, that in such cases both children were begotten at the same moment, but that the tardy birth..."
Churchill's Midwifery p. 158.
of the uterus was owing to its slower development, but this explanation requires previous proof that a slow growth of the uterus involves a protracted gestation.

As has been already suggested, the condition of double uterus may sometimes explain such cases.

Professor Torrey Barker relates an instance in his practice where, in double uterus, a mature living male child was born on 16th July 1850, and on the 22nd September following the mother gave birth to a full-term living girl.

The case which occurred to Mad. Brissin in 1810 in which a woman gave birth to a female infant on 15th March of that year and again on 12th May to a second female infant is given as another instance of the same kind. The mother assured Mad. Brissin that she had no connexion with her husband except twice in two months viz. on the 15th and 20th July 1809 and on the 15th of September following. Do these cases prove the theory of super-perfection? They are remarkable.
Certainly and many cause us to think
twice before saying, No; but we prefer
to reserve judgment and wait for
additional information before we adopt
such a theory beset with difficulties.
It was at one time entertained that
the condition of the uterous, shortly after
impression renders the occurrence
of a second conception physiological
call impossible on account of the
or being sealed up by a gelatinous
secretion. But it is now found that
this secretion, instead of being peculiar
as to the occurrence after impression
exists in unmarried women and
girls as well as in pregnant women.
Moreover haemorrhagic and other
discharges may, and sometimes
do occur during the earlier weeks
of pregnancy which would wash
away this secretion or cervical plug.
Besides doubt is now thrown on the
point—whether any such sealing in the
can earlier months of pregnancy takes
place.
It has also been shown by Dr. Matthew Duncan that the decidua reflexa is not in contact with the decidua vera till after the third month and that up to that time there may be free communications between the ovary and vagina. It would seem then that super fertilisation may be possible up to that time, but is the ovum thus to be fertilised, that is, does ovulation occur during pregnancy? It has been ascertained that several ova capable of fertilisation may be produced each menstrual period and that two ova may be impregnated at different times from same menstruation within a short period of one another is likewise undeniable, but what is the limit of time in which such occurrences may take place? To explain most of the cases of supposed super fertilisation it is not necessary to believe in the theory as they permit of another and different explanation.
We do not require to have recourse to it; for instance, in the case where
1. A full-developed child and a blighted ovum are expelled.
2. Where two unequally developed children are born, nor where
3. Twins are born of a different colour.

But what of the cases where a mature child is born two or three months after the first? In the case of a double uterus, each half or ovary having its own Fallopian tube and ovary it may be possible for a second conception to take place at a later period than the first. How are we to account for such an occurrence in a single uterus? One ovum capable of fertilisation being discharged during pregnancy? The fact that menstruation in most cases is absent during that condition would lead us to believe they are not.

We confess, however, that we wait...
for further light, wait, in fact, for the time when "physiologists shall demonstrate, by the presence of corpora lutea of different ages that ovulation occurs during pregnancy."
Pathology

The phenomenon of plural births is a departure from the natural course of occurrences and therefore involves structural and functional adaptations which otherwise would not exist.

I. Pathology in relation to the mother.

1. The presence of a plurality of children increases the size and alters the shape of the uterus.

In ordinary pregnancies where the uterine tumour attains no more than its usual size, a series of symptoms very frequently arise, occasioned by the unusual pressure upon the surrounding parts. When, from the presence of more than one child within the uterus or from other causes of extraordinary enlargement, the uterine tumour becomes exaggerated in size, the symptoms which result become more constant and distressing. Vertigo, depression, palpitation of the heart, dyspnoea, constipation, compression of the bladder, congestion and oedema...
Campbell’s Midwifery p. 545.
and some of the results arising from
the pressure of an over-distended
uterus. So frequent indeed is the pre-
sence of albumen in plural pregnancy
that it has been enumerated as one
of the Symptoms of that Condition.
The increased size of the uterus in
plural gestations also lessens a liability
to haemorrhage and this danger is
further increased by its indisposition
to contract thoroughly after over-dis-
tension.

2. The increased size of the placenta
is a source of danger to the mother.
The detachment from the uterine walls
and the consequent exposure of a
larger placental surface on them in
the case of plural births diminishes
the safety of the mother.

3. The production of plural births
is a greater invasion of the vital
powers of the mother.
This proceeds upon the simple principle
of supply and demand. In plural
pregnancies, the demand may be
Lectures 1840.

Collins' Practical Treatise p. 313.
Some extent, exceed the supply, and
the effects and frequently apparent
in such cases on both mother and
offspring. Dr. Campbell remarks
that "females of short habit rarely
so on to the full term in plural cases.

4. In plural births, the dangers inci-
dent to labour and more liable to
occur and the ability to resist them
on the part of the mother is diminished.

We are informed by Burns that the
chance of recovery in women giving
birth to Twins is supposed to be four
times less than in those who have single
children.

Sir James Simpson says "Twins are
twice or more dangerous to the
mother than single births, owing to the
danger of haemorrhage from the pla-
centae, labour being longer, and from
malpresentation."

Dr. Collins states that the ordinary pro-
portion of deaths in women giving
birth to Twins is one in twenty, whereas
with single children, a death does not occur in nearly five times that number.

"It is no matter," he observes, "what the nature of the attack may be, whether hemorrhage, fever, convulsions, etc. It will be found much more dangerous in women giving birth to a plurality of children than others."

The following abstract prepared from data furnished by him will show the greater mortality to mothers in twin labour:

Deaths of mothers in 16,654 deliveries 164 = 1 in 100

240 from cases 1 = 1 in 34

II. Pathology in relation to the Child.

1. As the number of children increases so does the chance of becoming under-developed and under-developed. In plural births the mother suffers from an increased demand for nourishment, so do the children from an insufficient supply of nutritive material. The size of children born at a birth usually corresponds to the number produced; that is, the size of each is diminished as the number is increased. "It is
often remarked, "Says Dr. Ranstoke Thomson that in twin gestations one fetus at birth is sensibly smaller than the other."

The weight of each child also suffers a similar diminution. In Simpson's statistics of the Edinburgh Maternity Hospital the average weight of a twin child is recorded as six pounds one ounce.

As the number of the children increases the development of each is correspondingly arrested and the probability of their being born alive and continuing to live is to be calculated in the same proportion. Thus twins and more frequently triplets than quadruplets and the probability of twins surviving exceeds that of a larger number.

2. A plurality of children suffer from diminished space for development. Besides suffering from defective nutrition, the development of more than one child in utero is interfered with by mechanical obstruction. I am not aware that much importance has been attached by observers to this.
cause of the impaired development of a plurality of children, but we know that pressure or confinement arrests to some extent the development of the parts so confined, when, therefore, the contents of the uterus are abnormally increased they must suffer by the consequent pressure arising from this condition.

3. The development of a plurality of children may be modified or arrested by the mechanical interference or contact of the children themselves.

To this cause may be referred many of the instances of monstrities and blight placed on which, from time to time, come under observation, and to account for which theories as extraordinary as the phenomena themselves have been enunciated.

4. The risks of particularities and greater loss by children in plural births. This is painfully evident in the greater mortality of children which accompanies short labours.

Dr. Churchill's statistics on this point
Show that out of 941 cases of twins, that is 1942 children, 482 were lost or about 1 in 4. Out of twelve cases of triplets (18 children) 11 were lost or 1 in 3. This mortality exceeds in a great degree that of single births. The proportion of deaths in these being less than one in twenty.

We have mentioned the word "monstrous" in our former subject, however we have only to deal (and this we shall do very briefly) with the "Double Maimer".

In each of the parts combining to form a double monster can be traced the structures, more or less clear, of two children. The union between the two is generally effected at the back sides, stomach or abdomen. As a rule such rarely survive their birth, but in some instances do occur in which they have survived and continued to live.

The Hungarian Sisters, the Siamese Twins and the African Twins and among the most remarkable cases. One peculiar, so far as I know, in the formation of double monsters, is that...
The twins are always of one sex. Double monsters, we believe, must be looked upon as originally cases of single-twin conception and that the extraordinary combinations they assume must be looked upon as a subsequent process.

In the early stages of gestation, it is probable that the two embryonic structures by an imperfection of the investing membrane of the ovum come into contact. The forming power in both is strong; contact becomes more intimate, anastomoses of vessels take place and permanent adhesion is the result.

Before leaving the consideration of the pathological conditions attendant upon twin births we have to ask the question: Is a female born column with a male stranger that such was the case is an ancient doctrine and in this day, in some places at least; it is a popular belief. With the view of throwing light on this question Sir James Simpson made it the subject of a searching investigation and the evidence collected
Satisfactorily confirmed the fact that no such alleged infecundity really exists. The result of his inquiry is thus expressed.

(1) That in the human subject females born co-erotic with males are as likely to produce children as any other females belonging to the community.

(2) That when they are married become mothers, they are in respect of the number of their children as productive as other females.

(3) That the same law of fecundity is as the female in respect to seed from same to hold good among all uniparous domestic animals with the exception of the cow alone.
Obstetrics.

We have now reached the last, but as far as medical practitioners are concerned the most important if not the most interesting portion of our subject. In treating of this we shall do so under three heads, viz. The diagnosis of, the presentations of the fetuses in, and the treatment of plural births.

I. Diagnosis

In no department of medical science has there been more rapid advance during the last thirty or forty years than in that of diagnosis. This is true of obstetrics as of other branches of medicine and in the means now placed at our disposal for determining the existence of pregnancy the advance has been marked indeed. In 1831 Dr. Copeh wrote, "It is impossible to ascertain the existence of twins before the birth of the first child." Forty years afterwards Kleinwachtler writes amongst the most important points which the practical midwife is to determine
The presence of twins during pregnancy is a frequent occurrence. Good's statement still true that of Kleinwächter must be of little practical value. Both statements seem to me open to objection. For on the one hand, it is by no means impossible to ascertain the presence of twins during pregnancy and on the other, Kleinwächter seems to me to have over-estimated the practical value of the fact after it has been ascertained. Success in the treatment of any case, whether medical, surgical, or obstetrical, depends, as a rule, on the accuracy of the diagnosis. Fortunately, however, for both patient and physician, this does not hold true of twins. Even if the announced did ascertain with certainty the presence of twins previous to labour, the knowledge, while flattering his diagnostic abilities and satisfying a commendable scientific curiosity, would in no way alter his conduct of the case.

As for the patient, the consciousness of her condition would afford her no...
comfort and probably increase her forebodings which, likely enough, are sufficiently gloomy already.

While we say that the presence of twins can be ascertained during pregnancy we are quite alive to the difficulties, in many cases, and the impossibility in some, of diagnosing their presence. We shall now examine some of these signs and symptoms usually set down as being indicative of the presence of twins, and try to determine their value.

1. An increased in the sympathetic and mechanical symptoms of pregnancy. Such as nausea, vomiting, cravings, edema. To any exacerbation of this condition we attach but little importance. The sympathetic symptoms are most pronounced in the earlier, and the mechanical, most marked in the later months of pregnancy. They may be present in an exaggerated degree in single pregnancy and sometimes they are present where there is no pregnancy at all, for example...
in ovarian irritation or enlargement of the abdomen from tumours.

This symptom, then, we cannot depend upon as being characteristic of the presence of tumours: the sympathetic depending in a great extent on the natural habit of the patient and the mechanical on the enlargement of the abdomen from any cause.

2. A greater increase in the size of the abdomen. Popularly, no symptom is more generally believed in, as indicative of true pregnancy and most worthy of less credence. No doubt in some cases of twins the abdomen is unusually bulky, but in others it may be, and often is no larger than in single pregnancy. Besides the greater size of the abdomen may be due to other causes, such as an excess of liquor amnii, dropping of the peritoneum or even an accumulation of fat in the abdominal walls.

This symptom, however much reliance may be placed upon it by the patient or her friends, by itself, conveys
but little information and to it little value is attached.

3. The form of the uterus, viz., in the division of the abdomen into two distinct halves by a longitudinal or oblique furrow, and by the increased breadth of the uterus. By some, great stress is laid upon this lateral bulging of the abdomen. Blundell says that it constitutes one of the most valuable signs indicative of plural pregnancy of which ours art is possessed.

But this furrow is not always present in twins and on the other hand, may be present where twins are not. And if the fetus be placed transverse, the abdomen may seem broader than usual, and also by irregular development of the muscular fibres of the uterus. This furrow and lateral bulging may be produced. Such conditions would probably suggest to the abdomen the possibility of twins being present but before his suspicion could become a certainty, he must hand recourse to

4. Palpation of the abdomen, which
In some cases it is an important means of determining the position of the foetus in a single pregnancy, and with maternal accidents by itself or along with other symptoms, to establish our suspicion of the presence of twins.

In a favourable case, favourable on the part of both mother and foetuses, we can trace the outline of the foetus, the lobular head, and other prominent parts, and of course if we trace the outlines of two foetal heads and corresponding increase in the number of the smaller foetal parts the case is pretty well established. By some authorities much importance is attached to this means of determining the presence of twins. We confess this being somewhat reserved in our enthusiasm for it and restrict our belief in it to "favourable cases". It may be that our past experience and some defect of the tactus crudities in our manual examination prevent us from giving it our hearty support, but our objections
are that in women who are the subjects of hydroamnios or the accumulation of fat, or from the position of the foetus or the presence of a double monster or a single malformed fetus, the difficulties that prevent themselves are not so easily overcome. Where everything is favorable for practising this operation we give it its place as a means— an important means of diagnosing the presence of twins that cannot with our present knowledge and experience, so far this.

The movements felt by the mother. We have only to remember that the sensations and experiences of pregnant women are, to say the least, unsafe foundations on which to build a theory or form an opinion, to make us hesitate to accept them as confirmatory of the presence of twins in utero.

6. Balloon. This is not of much value in twin cases, except where one foetus, probably the smaller one
is surrounded by an unusual amount of Liquor Amnii.

5. Auscultation. In our opinion this is the most important means at our disposal of determining the existence of a twin pregnancy. To the obstetrician the importance of auscultation cannot be readily overestimated as a means of diagnosing pregnancy. By the stethoscope we can determine with precision the existence of a single pregnancy, but in the case of twins there is room for error and fallacy. If, however, the fetal heart sound is heard at two distinct and separate points and the sound becomes less distinct in the intervening space our suspicion of twins is strengthened though not confirmed, but almost. If doubt still exists, let two observers at once and the same time auscultate the abdomen and count the fetal heart sounds and if they are found to differ in frequency, then I think
we are as near establishing the existence of a twin pregnancy as it is possible to be. Of course, this is applicable only when both foetuses are alive, so that even with auscultation we are not altogether free from doubt, or again the foetuses may be so placed, for instance, one behind the other, that it would be very difficult, if not impossible, to detect the fetal sounds.

Our position then with regard to the diagnosis of twin pregnancy is that in some cases it is extremely difficult to be absolutely certain of its existence. Instances sufficient puzzling, do occur to perplex and perhaps baffle the most persistent efforts of expert diagnosticians. In other cases however it is quite possible, we believe, to determine the presence of twins in utero. No one symptom is to be relied on, but if we find unusual size, accompanied by exaggeration of mechanical symptoms,
the recognition, by palpation, of a number of distinct fetal parts, and the evidences we have just indicated under Auscultation, we would be justified, I think, in telling our patient, that is, if she were anxious to know, and at any rate in saying to ourselves, that in all probability the case is one of twin pregnancy.

Should we, however, be baffled in our efforts to ascertain the presence of twins previous to labour, we are to some extent, consoled by the consciousness that this failure involves no danger to the patient and success would not in any degree affect our treatment or conduct of the case.
Spiegelberg, "Lehrbuch der Geburtshilfe" p. 203.
Presentation of the Foetus.

The opinions of different obstetric authors as to which presentation obtains in twin births are various and contradictory. But when we consider the remarkable diversity of opinion which exists upon the frequency with which such births occur in proportion to single births, Clarke, for example, giving 1 in 57 and Rowin 1 in 132, it is scarcely matter for surprise that differences of opinion should exist upon the minor point of the presentations in these cases.

Spiegelburg furnishes the following table derived from 1,138 deliveries of which 899 were taken from Kleinwächter, and 203 from Regus.

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both Heads presenting</td>
<td>558, or 49.7%</td>
</tr>
<tr>
<td>Head and Brach</td>
<td>361, 31.7%</td>
</tr>
<tr>
<td>Both Pelvis</td>
<td>97, 8.6%</td>
</tr>
<tr>
<td>Head Transverse</td>
<td>41, 3.6%</td>
</tr>
<tr>
<td>Breach Transverse</td>
<td>46, 4.14%</td>
</tr>
<tr>
<td>Both Transverse</td>
<td>4, 0.35%</td>
</tr>
</tbody>
</table>
Bandello que leads us to infer that the cephalic presentation is the most common but adds that the position and presentation in horses is subject to great variation. Evans leaves it an open question which presentation occurs most frequently but seems to incline to the cephalic. Burns says that as a rule if the first child presents by the head the second presents by the feet. Ryan holds that the head of the one and the feet of the other in the most usual presentation.

Randothian and Campbell think that it is most common for both heads to offer themselves downwards. Bedford admits great variety in the presentation but believes that in about two thirds of the cases each child presents by the head.

Simpson adduces the occurrence of horses as a cause of malpresentation owing to reflex irritations and movements of the foetus, forcing it to adopt
itself to the form of the cavity containing it and he proves by tables that although the cephalic occurs less frequently than in single births, still it is the most common presentation in births taking the birth of each child individually.

Up to within recent years, we believe attention was not much directed to and observations made on this point. With the exception of the opinions as above quoted, we have seen little literature on this subject and must therefore content ourselves with giving our own experience limited as it is. As already stated, we have attended many cases of twin labour on which we have made the following note:

5 cases, in which the children were male & female.

2 cases. Both male.

2 cases. Both female.

In giving the presentations in each we may not do it in the cleanest manner but will do so as they have been im-
pressed on our mind—And in doing so shall take the presentations of the elder child first.

<table>
<thead>
<tr>
<th>Presentation of elder child</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td>Breach</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Presentation of younger child</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td>Breach</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

We thus find that if the 16 births, the presentations occur in the following proportions:

- Head: 9
- Breach: 4
- Footing: 2

Carrying our analysis further, we find that the presentations were:

| Elder | 6  | 2  | 1  |
|-------|--|--|
| Younger | 3  | 5  | 1  |

Showing that though the Head presentations exceed the Breach only by two.
yet is the elder child they are in the proportion of 3 to 1 and that though the breech presentations fall short of the head only by two yet in the younger child they are almost 2 to 1.

From which we may infer (if inferences are allowable when the number is so small) that if the head is the normal presentation the younger child in twins is much more subject to Mal presentation.

Curiously enough the sexes were equally represented. In all 6 cases of breech presentation that came to our notice 3 males and 3 females.

Thus - Males - Females

Elder 6 3 = 9
Younger 3 6 = 9

\[
\frac{9}{9} = 1
\]

But when we come to examine the proportion of the sexes with regard to age we find a marked difference exactly in the proportion of 2 to 1.

In the five cases where male and female children were present 4 of
The elder children were male and 3 of the 4 presented by the head, the other being a breech. In only 1 case was the female born first and in this case the presentation was foetiling while the younger male child presented by the head. Thus:

<table>
<thead>
<tr>
<th></th>
<th>Head</th>
<th>Breech</th>
<th>Footling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elder</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Younger</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Showing that in the case of five male children, 4 were head presentations and 1 breech.

In the case of five female children, the presentations were 1 head, 2 breech, and 2 foetiling.

Also that in five cases of twins, the elder child was four times a male.

Analysis might be carried still farther, but the question has suggested itself to me - what influence (if any) has sex in determining the position in lungs and the presentation of the foetus in twins? I may perhaps
be treading on ground already trod by others; if so I am not aware of it, and have seen no work on the subject. The question was prompted by the facts presented to me in the cases I conducted and I ventured to think they are not without interest but whether they disagree with, or confirm observations made by others, more to those who have more experience in matters of this nature. I am quite aware that the number of cases is small, too small from which to draw conclusions but (leaving out of account the four cases two of whom boys and two of whom girls) when we find that where, so to speak, the chances were equal, that 4 out of the five older children were male (3 heads + 1 brick) and 2 of them prompted us to ask the question: What influence has sex on the position of the factors in utero in twins.

And when we find that out of five cases (male + female present in each) four males (3 eldest + 1 younger) present by the
head we are equally prompted to ask. Has there any influence in deter-
mining the presentation of the facts to which I refer in this
To answer that question is not the task we have set ourselves, but
in the meantime content with noting the facts. To suggest that there has
been a struggle in utero for preeminence and that the positions and pre-
sentations above-noted are mere instances of the "survival of the fittest"
we dare not. In these days of "equal rights" we would not assert
dare not even hint that man being
the superior animal had striven for
had gained an ascendancy over the
fainier, if weaker, vessel and in con-
sequence assumed the first place and position. But whatever be the
cause, if my smaller limited ex-
perience corroborates the observations
of others I shall be satisfied if
on the other hand, they should throw
doubt on statistics already collated.
and, surely, suggest further inquiry on wider bases and more extensive calculations. I shall be equally satisfied.
Treatment

It is not our intention to dwell on the different phases of twin-labour: the complications, many and various that may arise in the course of such a labour and the treatment appropriate to each. We shall content ourselves with giving a brief outline of the conduct or treatment of an ordinary case of twin-labour.

When summoned to a case of natural labour, there are certain rules of management which we obey—a certain mode of treatment which we follow and which have been inculcated by preceptors and adopted from a conviction of their propriety. In twin births the management of the birth of the first child is precisely that of the birth of a single child. Usually there are no circumstances to distinguish it from the ordinary birth of a child, and our treatment should, in no way, vary from that adopted...
in a case of natural labour. All the
diversity of opinion which has exis-
ted as to the management of twin-
labours, refers only to the birth of
the second child.
Probably, though not always, the labour
accompanying the birth of the first child
will be protracted. This is not to be
accounted for by any actual feulences
or want of contraction on the part of
the uterus (the pains may be strong) but
that its action may be modified by the
presence of a second child. The force
which, in ordinary circumstances, is
exerted on one child is not shared
by another, and perhaps also from
over-distension, the expulsive
action is to some extent reduced.

The first child is born. Nothing pe-
culiar attending its birth; the cord
has been secured by a double ligat-
ture, as a precaution which it is well
always to observe, as we are ever un-
certain what may lie in the womb.

Of future. If, previous to this
we have been unable to diagnose with certainty the presence of twins. We are now, at least, able to confirm our suspicion of their existence. The first thing to call for our attention is probably the persistent large size of the uterus and on passing the hand over the abdomen we find that the uterus tumour has, to no appreciable extent diminished. The fundus will be felt about the umbilicus, perhaps higher, and on examing for vagina we shall be able to detect the membranes of the second child. And now, it will be fortunate for us, if retaining our self-possession, we recollect our rules of management in a term labour, and conduct our case to a successful issue, much better however for us if we are armed from our reflections by the speedy return of uterine action and the natural expulsion of the second child.
I may here be permitted to give the rules for management of twin labour as given by my late respected teacher, Sir James Y. Simpson, from which, for clearness and conciseness I have seen nothing better.

1. Conduct the labour of the first as a single case.


3. If second present by head or pelvis, wait 1/2 hour. 200 if pains return.

4. If uterine still inactive, endeavour now to re-excite it.

5. If no return of uterine action in 1/2 hour deliver by force.

6. Deliver second child by turning as soon as possible if:
   
   (a) presentation of trunk or upper extremity
   (b) haemorrhage, convulsions, etc.
   (c) patient has suffered much in the birth of the first.

7. Re-examine for another child.

8. Withdraw two placenta as one mass.
The only part of these rules to which I would take exception is that portion of the second where the mother is not to be told.

In a primary case it may be all right enough & easy enough to conceal from her that she is about to become the mother of twins, but in the case of a multipara, at least in this district, they are too well versed in the natural order of events in an ordinary labour not to suspect that there is something wrong when the abdomen remains so large and when the accoucheur has futilely tried to hold up two fingers to the wound. The effect of telling them that this is supposed to produce such an amount of mental disturbance as would lead to the arrest of uterine action. Such a consequence might of course result, but on the other hand if the mother were conscious (as she is all probability would), that two were concealing...
or trying to conceal something from her, might not her fears be awakened and her dread of some
thing even more dreadful than the reality she presents to her mind and thus produce the very cata-
strophes we had been trying to avert. I do not say, "Tell the mother in every case." There may be reasons for not telling her but each case
or death is individual and may be treated on its own merits. If we decide upon telling her, it should be done calmly, confidently, and in a sym-
pathetic and cheerful voice.

Calmness and confidence on the part of the doctor will in many
cases beget, or assist in begetting the same qualities in the patient
and thus in a labour case, is of no
mean importance, not to mention the debt of gratitude she will ever
after consider herself under to you
for sharing her in the hour of
her travail and pain.
After the birth of the first child, and having informed the attendant and congratulated the mother, we may occupy the interval of waiting for uterine action by marking the first child in case of legal difficulties arising in the future.

In many cases this interval does not exceed five minutes, and rarely exceeds an hour.

The following table, prepared by Sir James Simpson, will illustrate the intervals occurring between the first and second births in 711 cases:

<table>
<thead>
<tr>
<th>Interval (Minutes)</th>
<th>Number of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>60</td>
<td>from 30 to 60</td>
</tr>
<tr>
<td>90</td>
<td>during 2 hours</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>from 4 to 11 hours</td>
</tr>
</tbody>
</table>

Thus showing that 162 were delivered
within the first half hour and 163 within the first hour. Only 28 being left beyond that period.

If uterine action is not set up and followed by the birth of the child within the first half hour what are we to do? Some of the older writers taught that it was necessary at once to infuse other that we should give Nature a chance, wait patiently and not attempt artificial delivery. Safety is usually found in the happy medium (in medias res) between extreme views.

Sir James Simpson taught "wait for half an hour" but modified by an important restriction viz. "if second child present be head or pelvis". Meanwhile we may be applying late artifices to induced uterine action. Friction or gentle pressure over the abdomen and keep the mother cheerful and in good spirits if such be possible and then if no return of uterine pains delay by the feet."

But as in speaking about telling the
mother is then we had detected the presence of the second child, we must treat the cases individually and on their merits. No hard and fast set of rules can be laid down which we may use to learn and forever keep for our guidance in every case. In the first case we meet with there might be circumstances which would render our set rules inexpedient or even hazardous. Cases will arise where the accoucheur must for the sake of his patient, instead of obeying sets of rules and systems of law, "do as he yields unto himself".

After this digression we are ready to interfere and at the end of the half hour if we have been unsuccessful in setting up uterine action, we may now try to excite it by rupturing the membranes. In many cases, this will be successful and owing to the dilated condition of the maternal passages the birth is easily and safely accomplished.

Of friction and pressure on the ab-
old men, assisted by rupturing the membranes, failed to produce pains and the birth of the Child within this hour. Then introduce the hand gently and carefully, and deliver by the feet.

Such is the general outline of treatment in an ordinary case of twin labour, but if the birth of the first child has been difficult or preternatural, he may be called on to interfere sooner and our treatment will in great measure be regulated by the circumstances or conditions that rendered the first labour difficult. Again, if we find the second child presenting by the trunk or superior extremity, we do not wait because the chances of nature accomplishing the birth are diminished and our inter-ference at an early date is called for. We then calm the mother's fears and husband's strength, and in general leave her, after the birth is over, in a condition better calculated to produce a good recovery than if we had refused to interfere. And this condition
on the part of the mother requiring our prompt interference is the occurrence of haemorrhage, convulsions or such-like dangerous symptoms. Then, "delay" and emphatically dangerous. The uterus must be promptly emptied of its contents, and the patient receive that treatment which the presence of the same symptoms in the case of a single birth would demand.

After the birth of the second child has been safely accomplished, and the cord secured, as in the case of the first, by a double ligature, we have to direct our attention to the placenta. Here, as we have seen, may be separate or partially united. For this reason we never try to remove the placenta of the first child till after birth of the second. Preserve over the uterus may now be made, with advantage and we think it is absolutely necessary for doing to the previous distinction of the uterus, this organ.
Collins Midwifery p. 312.
is now less disposed to contract and it is just in this case; owing to the larger placental surface that will be exposed, and the greater risk of hemorrhage that we wish to contract as thoroughly and as perfectly as possible.

In this case says Dr. Collins when it becomes necessary to remove the placenta, we should be careful not to withdraw our hand from the uterus until both be separated at the same time, waiting for uterine contraction, as to induce as perfect a contraction of this organ as practicable, a point of most vital importance.

When practicable we remove the placenta together, and this is done in the great majority of cases. We next look to the mother. If, from exhaustion or other causes, she requires a stimulant we must see that it is given and keep a sharp look out for hemorrhage or any unusual symptom. The case is now to be treated as one of ordinary labour.
but the care and precautions necessary for the safety of the mother in such cases are, in the case of twins, to be redoubled, whether owing to the greater severity of the labours through which she has just passed or owing to the greater dangers to which she is now liable.

Leading a tolerably busy life in a country district; away from the seats of learning and the centres of education and deprived, to a great extent, of the stimulus of professional intercourse and discussion, I am painfully aware of the defects: the imperfections and inaccuracies which will be only too apparent to the more acute intellects and the more enlightened minds of an University city. But if I have
said anything to interest, or made any suggestion worthy to be noted, and if, haply, the Medical Faculty of the University of Edinburgh - combining merit with judgment - should take a lenient view of the production of one who in August next will have attained his majority as a M.B. C.M. of that University, the present paper shall have served its purpose.

John Arivisou

Castro Douglas

29th April 1891