

Plural Pregnancies
Their History. Anatomy.
Physiology. Pathology & Obstetrics
By
Charles Macpherson M.B.

Bonar Bridge, South Australia
15: June 1898

ProQuest Number: 13906489

All rights reserved

INFORMATION TO ALL USERS

The quality of this reproduction is dependent upon the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if material had to be removed, a note will indicate the deletion.



ProQuest 13906489

Published by ProQuest LLC (2019). Copyright of the Dissertation is held by the Author.

All rights reserved.

This work is protected against unauthorized copying under Title 17, United States Code
Microform Edition © ProQuest LLC.

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 – 1346

Although the reproductive process is still so obscure as to leave ample scope for further enquiry, the laboriously conducted researches of thoroughly capable investigators have largely contributed to the elucidation of many points which were formerly shrouded in mystery. The formation of a simple cell marks the beginning of the reproductive process alike in the animal and vegetable kingdom. Confining our attention here to the development of this process in the case of the human species, we find that from this primal cell a multitude of other cells are produced, each of which is capable of becoming a new organism endowed with its own special functions. In due time as these cells exert their capabilities, the result appears in the formation of the separate functional parts of the embryo. The simple cell, therefore, has only to pass through a regular course of development, - has only to have that power called forth which in germ lay concealed in it - and the product is that

2

that wonderfully complex organism, man
in all his structural and functional
perfection

But although our research has been
thus rewarded by a disclosure of the
phenomena of reproduction, yet the
processes by which these phenomena are
brought about, are still enveloped in a
mystery which we can never hope wholly
to clear away. Many unsolved, and
apparently insoluble problems here present
themselves. What is life? At what
precise moment does the new personal
life begin? By what means and through
what channel is the new life commu-
:icated? These are questions which
Physiology, even when aided by Psychology
and by the revelation of Holy Scriptures
has not been able, and probably never
will be able to answer. We see and
mark the processes, that lead up to
the very beginnings of life, we see
and mark again the very earliest
manifestations of life, but the actual
coming of life in the formation of a
new

new existence has been marked by none. It is evidently the result of an influence too subtle for the human faculties to observe, and comprehend. one of the countless emanations of that Power, which works in secret, the nature and mode of whose operations, the mind of man cannot estimate but which produces such stupendous results as to excite in us the liveliest interest, and to awaken the most profound admiration.

The leading and characteristic features of the reproductive process are preserved in the case of all animals without any exception. But when we come to consider the times and circumstances of the several phenomena of reproduction we find that these present diversities as wide and as numerous as the distinctions of the various tribes and classes into which the animal Kingdom is divided. In some animals impregnation is effected frequently, and the term of gestation is of short duration; in others the period of gestation is

Very

Very protracted and the occurrence of impregnation correspondingly infrequent. In the case of certain animals, again, we find that almost always they produce their young not singly but manifold; whereas in the case of others the normal procedure is the production of one at a birth.

In all the processes of nature, however, departures from the normal type are not infrequent. Plural Births may be regarded as an important abnormality in the generative process of the human female. Interesting and of practical account as the subject undoubtedly is it is surprising to find the literature upon it so scanty and fragmentary. Materials for a history of this phenomenon have to be gathered from brief notices in the transactions of learned societies from reports of individual observers in medical journals, and, after due sifting from records of extraordinary cases in local newspapers, contemporary with the occurrence. In consequence of the

Condition

² Philosophical Transactions 1804 & 1805

5

Condition in which the history of the subject presently is, it will be necessary to trace the outlines of our subject from a historical and statistical point of view before proceeding to discuss the Anatomy, Physiology, Pathology and Obstetrics of this abnormal Condition

I History and Statistics of
the occurrence of Plural Births

Throughout the whole world of nature and particularly in the animal and vegetable Kingdoms instances occur of exuberance or redundancy or plurality - whichever of these terms we may prefer, - or regard as most suitable, - in which the normal and customary type is in circumstances of more or less importance departed from. The careful observer of the processes of nature, is obliged to admit that no hard and fast rule of adherence in detail to any one course of procedure, can be safely laid down, - that no bounds can be rigidly assigned to the operations of nature. In any general classification of orders

1 Genesis 25 - 24

6

orders in the animal Kingdom, we should unhesitatingly rank the human female among the uniparous, and yet experience shows that the normal limit is very frequently exceeded, and it seems impossible to indicate the precise point beyond which every report of human fertility is to be regarded as absolutely incredible.

In plural births, the most usual number of children produced at a birth is two. Indeed twin births may be regarded as a common occurrence.

The account given of the birth of Esau and Jacob is the first recorded instance of twin production.¹

Triplets, or the production of three children at a birth is a much rarer occurrence. This phenomenon occurs at such great intervals that a large obstetric practice of many years duration may fail to furnish a single instance. Dr. Gartshore observes that "in a pretty extensive practice of above thirty years duration, both in the County of Rutland

¹ *Philosophical Transactions* 1787 p 351

² *Lancet* 1849 Vol II p 375

³ *British Medical Journal* 1882 Vol I pp 894-932

" Rutland and in London I have attend-
" ed but one labour where three children "
" were born; am personally acquainted with "
" but one lady who - at Dumfries in Scotland "
" after bearing twins twice was delivered of "
" three children at once, and I was never "
" acquainted with any one who produced a "
" greater number." I More recently we
" have a number of authentic cases, reported
" ed in the Medical Journals. Dr. Smith
" of South Norwood, reports a case where
" three female children were born, and
" all of whom were alive ten days afterwards."²
" Dr. Aldrich of Mildenhall reports a case
" where triplets - two girls and a boy were
" born and all were alive a week afterwards
" and Dr. Clitheroe of Peckham Rye records
" two cases of triplets occurring in his
" practice within a fortnight of each other."³
" Several similar cases are reported in
" the Medical Journals during the last
" few years; and during the present year
" (1888) a case has occurred in my own
" neighbourhood, where a woman was delivered
" of three children, all of whom are alive
" at

¹ Morning Chronicle 13th December 1817

² British Med. Journal 1857 Vol 1 p 584

at the present time. An interesting example of the successful rearing of triplets is recorded in the "Graphic" of 5th Janr 1884 where we have a notice of the presentation of a bouquet of flowers to the Princess of Wales, by the three daughters of Captain W. J. Young of Wolveston Hall, Eleanor, Gwendoline and Maude triplets aged seven years. Another and older instance is recorded of the successful rearing of triplets to the age of twenty one years. "Mary Baker" wife of Robert Baker carrier at Streatham "in the County of Surrey was delivered on the 11th December 1796 of three children one boy and two girls; the children all thrived well have all grown up hale and strong and are now all living having on Thursday completed their twenty first year"

The production of four children at a birth is a very rare occurrence. The most recently recorded case occurred in Ireland, where a woman gave birth to one boy and three girls all of whom were alive when the case was reported. Another case occurred recently in Paris where the woman was prematurely

'British Med Journal 1886 Vol 1. p 938

prematurely delivered of four children all of whom died however in a few hours! Another case is recently recorded in the Canadian Practitioner where four children - two boys and two girls, - were born alive. Going further back we find the following instances of quadruplets recorded in the Gentlemen's Magazine - which Dr. Gartshore regarded as a pretty authentic record of the times, - as occurring between 1736 and 1757.

- | | | |
|------|------|-----------------------------|
| 1736 | One. | 1 son & 3 daughters |
| 1743 | " | 2 sons 2 daughters |
| 1746 | " | 4 sons (3 living) |
| 1752 | " | 4 Children sex not recorded |
| 1757 | " | 3 sons and 1 daughter |

The most extraordinary example of plural births at all authenticated is that published by Hermann in his Travant Statistiques de la Russie "Fedor Vassilch" "peasant of the government of Moscow had" "by two wives eighty seven children His first" "wife in twenty seven accouchements had" "sixteen times given birth to twins; seven" "times to triplets; four times to quadruplets" "never to a single child The second wife

¹ *Lancet* 1878 vol. 1. p 289

² *Philosoph Transactions* 1787 p 355

³ *Campbell's Midwifery* p 295

"was similarly fruitful and bore eighteen"
 "Children in eight accouchements", In 1842
 eighty three of the eighty seven children were
 said to be still alive^I

The occurrence of five children at a birth
 is exceedingly rare. The Gentlemen's Magazine
 records two instances. The first was that of
 a woman who lived in the Strand, London
 and was delivered of three boys and two
 girls at a birth; the second was that of a
 woman in Somersetshire, who gave birth to
 four sons and a daughter. "All alive all"
 "christened and all then seeming likely to live"
 Gartshore mentions two similar cases which
 occurred one in Upper Savoy, the other near
 Prague² Chambon relates an instance
 of the birth of five children at one confine-
 ment at which he was present; all the
 children survived long enough to be carried
 to church for baptism³ A patient of mine
 whom I have every reason to regard as
 trustworthy informs me that on one
 occasion, some twenty years ago, a woman
 residing in the neighbourhood of
 Portroy in Banffshire was delivered
 prematurely

' Merriman on Difficult Parturition p 260

prematurely of five children, two of whom lived for a few hours. My informant states that she saw four of them. but that there was "something wrong" with the fifth. As the practitioner who attended the woman is since dead it is difficult to get any more authentic information regarding the case

Although there is certainly no reason why we should fix the limit of possibility in regard to plural births, at the production of five children at a birth, yet when we pass beyond this it is difficult to regard the reports presented as worthy of serious consideration Dr. Osborne indeed is reported to have witnessed the expulsion of six abortive ova' Again the birth of seven children is recorded by Albucasis an Arabian physician who lived in the early years of the twelfth century He however, belonged to a race, and lived in an age, when, an embarrassing freedom was allowed to the play of the imagination With a singular simplicity of mind which indicates at once the credulity of the writer, and his firm belief in the

Credulity

Ambroise Paris works translated by Johnson
1678 p 592

credulity of his contemporaries Ambroise Paré records instances of extensively multiplied generation, to the recital of which the more shrewd and sceptical intellect of modern times cannot be prevailed upon to give serious heed. Among other marvellous narrations we are asked to believe the story of a woman "who by" "some external injury did abort and brought" "forth fifteen children perfectly shaped in all" "their parts" We are also gravely informed that one "Margaret was brought to bed of" "thirty five live children on the 20th day of" "January 1296" Still more extraordinary cases are similarly recorded by old writers, but as we have already far passed the bounds of modern credulity we will pass on now to consider the extent to which this departure from the normal condition is carried

Statistics

The proportion of plural births to the whole in European countries, as stated by various observers may be tabulated as follows: —

Place	Observer	Twins	Triplets
Dublin	Clarke	1 in 56	1 in 3435
"	Johnston & Sinclair	1 in 59	1 in 13,748
"	McClenock & Hardy	1 in 68	1 in 6634
"	Churchill	1 in 65.5	1 in 1640
"	Dublin Hospital	1 in 62.5	1 in 4454
London	Ramsbotham	1 in 91	1 in 16,332
"	Merriman	1 in 75	1 in 2947
"	Bland	1 in 80	
"	Conquest	1 in 90	
"	Denman	1 in 92	
Edinburgh	Simpson	1 in 83	
Glasgow	Burns	1 in 93	
"	Pagan	1 in 90	1 in 8587
Paris	La Chapelle	1 in 93	1 in 5160
	Bowin	1 in 132	1 in 6785

Taking an average from these statistics we find that the proportion of twin births to a single birth is 1 in 82 and of triplets 1 in 6972. As only a small portion of the world, however, contributes to the formation of this table it would evidently be fallacious to make any general deductions from it. We know that the average greatly varies

Egede description de Greenland p 112

² The Races of Man Oscar Peschel 1876 p 235

³ Saggi su la storia naturale de Chile p 333

⁴ Anthropology. Tappinard 1878 p 367

in different nations. In northern latitudes plural births are comparatively rare as a rule. Among the inhabitants of Greenland we are told that the birth of twins is exceedingly rare. Again in tropical regions the rarity of plural births is occasionally mentioned by writers. We are told that it is a rare occurrence among the Indians on the Orinoco river, and that amongst them the strange idea is held that every woman who gives birth to twins must necessarily have been guilty of adultery.² On the other hand Pliny and Aristotle regarded Egypt and Arabia as the frequent birth-places of twins and triplets and described the women of these countries as exceedingly fertile. Molina gives a similar account of the people of Chile.³ Apparently however climate cannot be the important factor in these variations for of all the countries of which we have reliable information Ireland and Russia would seem to contribute the largest proportion of plural births.⁴ The theories as to the causation of this condition will be discussed further on. Dr. Churchill gives very elaborate statistics in his work on the Theory and Practice of

of

of Midwifery 4th Edition pp 441-2 to show the frequency of Plural Births in the practice of British, French and German observers. The results of his investigations may be summarized thus: -

	Twins	Triplets
British	1 in 70.7	1 in 5977.5
French	1 in 107.4	1 in 6551.5
German	1 in 86.1	1 in 9361

From the same authority we learn that the proportion of twin births to the total number varies considerably in Scotland, England and Ireland. The comparative frequency of the occurrence of plural births in Ireland is very noticeable.

In Scotland the proportion is 1 in 88.6
 England 1 in 85.6
 Ireland 1 in 62

I think we may take it however, as the generally received opinion that the proportion of plural to single births all over the world is about 1 in 90.

Sex

In twin births - as I think most observers are agreed - there is most frequently a
 chief

Child of each sex present. In regard
 to the cases in which we have two children
 of the same sex present, a difference of
 opinion exists as to whether the birth of
 male or female twins is the more frequent
 occurrence. In my own very limited experience
 twin male children have been the more
 frequent, but I think it is generally
 believed that twin females occur more
 frequently in Scotland, and the investigation
 of the late Sir James Simpson supports
 this belief. The proportions in which the
 different sexed combinations occurred in
 59,178 cases of labour collected by him
 was as follows

- 1 Male & Female Twins 1 in every 199 labours
- 2 Two female Twins 1 " 226.
- 3 Two male Twins 1 " 258

From Statistics of the Edinburgh, London and
 Dublin Hospitals he collected 788 twin labours

	No of Twin Cases	Males	Females	One M & F
Edinburgh	46	16	17	13
London	318	93	111	114
Dublin	424	120	133	171
	788	229	261	298

These conclusions differ considerably from those of Dr. Churchill who holds that in the case of cotwins next to one of either sex, twin males are the most frequent. In 1321 cases collected by him 416 were both males, 409, both females and 495 one male and one female. Among the observers who contributed to his statistics only one Dr. Ramsbotham contributed cases occurring out of Ireland. He contributes 536 cases of which 171 were both males, 183 both females, and 182 one of each sex. This would tend to support Simpson's view as to the greater frequency of twin females. If we deduct this number from Churchill's statistics and leave only the 785 cases collected by Irish observers we would have 246, both males, 226 both females and 313 one male & one female.

We have seen that Ireland contributes a much larger percentage of twin births than England or Scotland. May not the same reason - whatever it may be - which determines the excessive fertility in the Irish people also account for the larger

larger proportion of male children?

Theories

Many theories have been advanced at different times to account for the production of plural births, but neither their number nor ingenuity seem in any degree to have diminished the obscurity which surrounds the subject

We may examine a few of these theories

1 It has been argued that climate and the stage of civilization to which a country has advanced exert an influence on the numerical production of the human female. This argument has been founded on statistical information showing that the proportion of plural births in one country exceeds that in another. Thus we have seen that the proportion of plural births is much greater in Dublin than in London. But such statistics do not necessarily lead to any such conclusion. Indeed it is highly improbable that such agencies have any effect whatever. We have yet

yet to learn that any such important
 difference exists between the climates of
 London and Dublin; and if it be meant
 to suggest that multiplied generation occurs
 in proportion to inferiority in the state of
 Civilization it is unfair to institute a
 comparison with a result so unfavourable
 to the latter city. Besides if inferiority in
 Civilization had such an effect we would
 expect to find multiplied generation carried
 to a much greater extent among barbar-
 -ous nations. This as far as our present
 knowledge goes is diametrically opposed
 to the fact. True, the objection may be made
 that we have no statistics bearing on
 the point from uncivilized countries; but
 if a low position in the scale of Civilization
 had such a marked effect on the increase
 of plural births the phenomenon would
 occur much too frequently to escape your
 general observation: and any observations of
 travellers among uncivilized tribes go rather
 to prove the extreme rarity of plural births.
 Again it has been argued from the same
 data, that, not among the savage races
 but

but amongst those who have reached
 highest in the scale of civilization are we
 to look for the largest proportion of plural
 births. In favour of this argument we have
 the fact brought forward, that the sow farrows
 more young at a birth, and also more
 frequently when domesticated than when in
 a state of nature. But before we could
 accept this statement as at all corroboration
 of the theory, we would require to determine
 what were to be regarded as analogous
 conditions and circumstances, in the human
 female, and then have evidence that in
 these circumstances the same rule held
 good. It is not easy to conceive on
 what principle an observer would
 determine what these analogous conditions
 were. And supposing we accept the analogy
 we would then naturally look in the
 highest circles for a greatly increased
 number of plural births. That this is not
 the case, may be noticed by the most
 casual observer in our own country. It
 is not among the daughters of luxury
 but rather among the poor and toiling
 sections

¹ Abstracts book Vol 1 p 318

sections of our population that we observe the frequent occurrence of this phenomenon.

II It has been argued that the tendency to multiple generation is hereditary. This belief is strengthened by the fact that many instances are recorded of the cases of women who have exhibited as great a liability to plural production as to render the phenomenon a constitutional one. Sir James Simpson states that he knew a family in the different branches of which twelve pair of twins had been born within three generations.

DeWees knew of the case of one woman who had given birth to twins five consecutive times, and who up to that time had not had a single birth. Of the same class is the case of the wives of the Russian peasant already referred to. I know myself of two families in one of which two sisters have each on three different occasions given birth to twins, though not consecutively; and in the other one daughter has had twins twice, and the wife of a son has also had two pair of twins. In the first of these cases there had been one pair of twins in the preceding

preceding generation I think then we may take it as an established fact that preternatural fecundity is to a certain extent hereditary. It exists as really as any phenomenon in nature but yet offers nothing in explanation of the cause of the occurrence of plural births.

III It has been said that some seasons appear to be more prolific than others as well in the human race as other productions of nature. Denman affirms that "it is common observation the production of twins is more frequent in particular years than others" and he adds that "it can scarcely be doubted that there is some relation in those years between the animal and the vegetable Creation." In the Orkney islands where I lived for some years and I believe also in the Hebrides it is a matter of common belief among the peasantry - who are mostly of the crofter fisherman class - that the seasons when skate are plentiful on the coast - and consequently enter largely into the diet of the people - are followed by seasons of extraordinary fecundity. These
 opinions

Opinions however are only grounded on "common observation" and consequently we must in the absence of statistics be careful not to arrive at generalizations too readily. Whether that which has been observed is merely the effect of a coincidence - of accident as it is termed - or whether it is really the result of a law, which influences all the productive processes of nature is - as yet - beyond the reach of our knowledge.

I would venture to suggest that all these conditions have something to do with the production of an exalted state of functional activity of the ovaries, resulting in the frequent expulsion of more than one ovum at a time; and that this condition of exalted activity must be regarded as the primary cause of plural births. We know that such exaggerated functional conditions are manifested by other organs, and the theories which are advanced to account for increased functional energy in these, may fairly be applied to account for the same conditions in the ovaries.

Section II

± Anatomy. We willingly quit that part of our subject which is purely speculative and theoretical, and turn to the tangible part of our enquiry namely the Anatomy of plural pregnancies. The cause still lies beyond our reach, but the effects of that cause we can see and handle.

In treating of the Anatomy of this subject it will be impossible to avoid blending with it some reference to Physiology although the latter will be considered afterwards to some extent by itself.

1 The Ovaries and Ova

The ovaries are two glandular bodies situated one on either side of the uterus. Their function is to elaborate and furnish the female contribution towards the formation of a new being. Scattered throughout the structure of the ovaries there are placed a varying number of cellular structures called the Graafian follicles. In these the ova are found during their residence within the ovary. These are seen to be in various stages

stages of development. Those immediately
 under the superficial coat of the ovary
 are the smallest. Larger sized ones are
 seen embedded more deeply, and these
 on reaching maturity become distended with
 fluid and again approach the surface
 pushing before them the coats of the ovary
 and ultimately projecting from the surface of
 the gland. The distension goes on increasing
 and finally the coats of the ovary and of
 the vesicle itself give way and the ovum
 escapes & is grasped by the Fallopian tube.
 At the point of escape a peculiar structure
 remains which has been called from its
 appearance the Corpus luteum. If the ovum
 becomes impregnated it remains in the uterus
 on reaching there and becomes developed into
 a perfect human being. If not impregnated it
 escapes and accomplishes nothing. In either
 case the Corpus luteum remains distinct for
 a time. But when pregnancy takes place a
 hypertrophic change takes place in its structure
 and the Corpus luteum of pregnancy can be
 distinguished by its white lining membrane
 and large central cicatrix.

Such is a very superficial resume' of the conditions attending the progress and discharge of an Ovary either as the result of menstruation or pregnancy. We have now to consider how the production of plural births affects the same organs.

A The number of children produced at a birth is not dependent on the number of ovaries. Twins may proceed from one ovary, or one ovum may be contributed by each ovary. When there are more than two children, then two at least must be contributed by one ovary as no case has ever been observed where more than two ovaries were present. We have distinct

evidence that a plurality of children may occur when only one ovary is present.

This statement is confirmed by a case reported by Dr. Granville in the Philosophical Transactions for 1818 where he records the condition of the uterus and appendages in a woman who had died after giving birth to twins. The left half of the uterus was absent and there was no left ovary or Fallopian tube. Dr. Granville Bantock also

reports

¹ British Mycological Journal Vol 3 p 492

² Philosoph. Transact 1787 p 236

reports a case of the birth of twin boy and girl two years after he had removed a right ovarian tumour from the mother!

The results of experiments on the lower animals is also corroborative of this. John Hunter removed an ovary from a pig. The animal farrowed eight times after the operation and produced seventy six pigs.²

B More than one ovum may be liberated from a single ovary at one time, each accompanied by the same phenomena as have been described as attending the liberation of one. Two or more ova may be matured at the same time - may escape from the ovary and travel on to the uterus together, where each may be maintained distinctly from the other. In this case a corresponding number of Corpora Lutea would be produced and then a plurality of the phenomena already referred to would occur. We have the authority of William Hunter in support of the statement that such a condition actually does occur. "Where there is only one child" he says "there is only one Corpus Luteum and two in the case of twins." He further states "in some of these cases there were

¹ Anatomy Gravid Uterus p 14

² Principles of Obstetrics p 130

³ Montgomery Signs & Symptoms of Pregnancy, p 463

"were two distinct Corpora lutea in one
 "Ovarium" Dr. Blundell also makes the
 same assertion? I am not aware that two
 Corpora lutea of pregnancy have been observed
 in the same ovary by any recent observer.

But while recognising the general truth
 of the statement that the number of
 Corpora lutea corresponds with the number
 of children produced, we must guard against
 the erroneous supposition that this is a
 universal law. - that this correspondence never
 fails; as we shall presently see there are
 instances where wide departures from this
 general principle are observed.

C Two or more ova may exist in one
 Graafian follicle, and then we may have
 a plurality of children without the production
 of a plurality of Corpora lutea

Dr. Montgomery gives a case he says
 "some years ago a woman named Keefe died"
 "in St. Patrick Denis hospital, after giving"
 "birth to twins of six months each female"
 "and on examination by myself one large Corpus"
 "luteum only was found in the right ovary"
 "and none in the left" Dr. Grassill

Bantock

1 British Gynaecological Journal Vol 3 p 491-2

Banlock also reports a case where there were two fœtal foetuses of four months gestation and only one corpus luteum of pregnancy in the left ovary². In these cases it is a legitimate inference that two ova were contained in one Graafian follicle.

It is also now pretty generally believed that cases occur where with only a single ovum in the Graafian follicle twins are produced. How this comes about is not quite clear. It has been supposed that here the germinal area subdivides and then joins ^{to} twins.

II The Fallopian Tubes.

There are two canals, each about four inches in length which proceed from the upper and outer angles of the uterus. The upper extremities are free and expand into fringe like processes, and it is by these fimbriae that connection is established between the tubes and the ovaries. When an ovum escapes from the ovary it is seized by the fimbriated extremity of the corresponding Fallopian tube, through which it passes and after several days - the precise period is

is. I think yet unknown. - it reaches the uterus where it is found invested in a new membrane which has probably been acquired in its passage. - the Chorion.

When we have plural pregnancy each tube will have been called into service if we have an ovum contributed by each ovary. And if more than one follicle has ruptured at the same time in the one ovary, we must suppose that the embrace of the fimbriae will include all together, or that one follows the other within a short space of time.

III The Uterus

As soon as does impregnation occur than a series of changes takes place in the uterus which prepare it for the future residence of the germ. Its physical structure and physiological action become altered. It enlarges. its mucous membrane becomes hypertrophied, it becomes much more vascular and forms the decidua. This membrane is distinguished in different parts by different names the decidua vera, reflexa and serotina.

The only physiological difference produced in the

the uterus by the presence of a plurality of children is a difference in degree, depending upon the necessary requirements which an increase in the number of its occupants must give rise to. The entire physiological condition is heightened; the extent and the reflexions of the decidua membranes are increased and altered; and it has to accommodate a larger placental surface. Its physical conditions are influenced by the presence of more than one child. It is proportionately more enlarged than in a single conception and its shape is generally broader & more flattened.

IV Chorion and Amnion

These are the membranes of the Foetus. The Chorion is the outer covering and is formed earliest. The outer layer is formed of epithelial cells, the inner is connective tissue. On the outer surface there are projections known as the villi of the Chorion, which become vascular and are in contact with the Decidua. The Chorion is separated from the Amnion by loose connective tissue. This latter membrane

immediately

immediately surrounds the embryo at first and is more vascular throughout than the Chorion. As time advances a quantity of fluid is developed which distends the sac formed round the embryo. This is the *Liquor Amnii* in which the child floats. When we have a plurality of children we find some differences in the distribution of the membranes.

(a) We may have a distinct set of membranes for each child and each may possess a separate placenta. This is to be regarded as the normal condition of parts. It is simply a repetition of the phenomena which mark the presence of one child in the uterus, - the anatomical relations of the subject are multiplied. We have to imagine that two or more ova descend about the same time (or at an interval) - that no contact takes place between them; - that each enters the uterus invested by its own chorion and adheres to a different portion of the decidua. Thus each becomes developed and matures distinct from and independent of the other. But whilst theoretically this is the

normal

¹ Human Physiology p 795

² System of Midwifery p 546

normal anatomical history of plural births the actual occurrence of the condition we have just described is by no means frequent. The modifications are so many and so great as almost to defy any attempt at classification.

B. We may have one Chorion enclosing more than one child while an Amnion may be possessed separately by each.

Elliotson in his work refers to this condition¹ and Dewees also informs us that this remarkable disposition of the membranes actually does exist²

C. One set of membranes may enclose more than one child. In this case two or more children are floating in a common liquor Amnii. This condition is not uncommon and is referred to by several writers

D. The children in utero may not possess the membranes alike. Thus we may have triplets, two children having membranes in common, and one in a separate sac. In such a case we should expect to find only two Corpora Lutea as it

it is generally supposed that two children produced from one Graafian vesicle usually have the membranes or some of them in common.

V Placenta.

This is developed upon a portion of the Chorion. It is the medium of communication between the mother and the offspring, and is the source of nourishment to the foetus. It consists of a foetal and a uterine portion. The foetal portion is smooth and shining, being covered with the amnion. It is developed from the vascular villi of the chorion. The uterine portion is formed from that part of the decidua which receives these villi. It is irregularly lobulated, being divided by fissures into several cotyledons. It is a round or oval spongy mass. Its usual diameter is from six to eight inches; its thickness in the centre about one and a half inches, and its weight from one pound to twenty ounces.

(a) In plural births we may have a
separate

separate and distinct placentas for each child. This - like the similar distribution of the membranes already spoken of, - is to be regarded as the normal condition although it is not of very frequent occurrence.

B) We may have what are really separate placentas, so united at their edges as to form one mass. This, indeed, is most generally the case, and were it not for the adhesions of the placentas, the most usual arrangement would be that of an individual distinction and separation of the foetal appendages. In most instances each child occupies a cavity for itself and its only connection with its twin companion is by the adhesion of the placentas. This adhesion usually involves no vascular connection between the two organs: it is a mere union of the edges of the two masses.

(C) We may have only one placenta existing for two or more children. This is a comparatively rare occurrence. Mr. Wardlaw relates a case in the Medical Gazette

1 Denman's Practice of Midwifery p 448

2 Churchill's Theory & Practice p 109

3 Denman p 448: Med Gazette 1841 p 472

Gazette for June 1841, when five children were born at one birth, and in which there was only one enormous placenta present.

VI Umbilical Cord.

This is the connecting link between the foetus and the placenta. In plural pregnancies, the normal condition and by far the most frequent is, that each child has a separate cord which has no connection with that of his Co-twin. But from this normal type we may have several variations

- (A) We may find the cords of two children so twisted together as to appear like one.¹
- B.) We may find the cord of one child insinuating with that of another.²
- C.) We may find one cord proceeding from a common placenta, and afterwards dividing to supply more than one child.³

Section III Physiology.

As the result of a careful survey of the phenomena which constitute the Reproductive process two great principles of physiological science have been established

1 That every living organism has taken its origin from a preexisting organism

2 That every germ - when placed under circumstances favourable to its complete evolution, - will develop itself into the likeness of its parent, drawing into and appropriating by its own assimilative and formative powers, the nutrient materials supplied to it, and repeating the entire series of phases through which its parent had formerly passed, however multiform these may have been.

These two great primary truths are illustrated, whenever the reproductive process is performed uninterruptedly.

In plural births there is no arrestment or modification of the process of reproduction; there is simply a plurality of the conditions which develop its exercise. The physiological relations then, of multiplied production

differs

differ in no way, as regards the principle of their production from those of a single birth. The impregnation of the ovum, - its changes previous to the formation of the embryo, - its transformation within the uterus, - the appearance of the Osseous Vascular, Nervous and Muscular Systems - in short all the stages by which the germ becomes developed into the child are to be traced in plural as well as in single births. The vital processes which constitute Generation and Development are being carried on at the same time in more than one Centre.

The nature and influence of the sexual functions in the production of plural pregnancies have been the subject of much investigation, and have been variously estimated.

1. Is plurality of children the result of one impregnation? The general opinion seems to be that it is, and the probability of the correctness of this opinion is confirmed by the fact that a plurality of children has been produced when sexual

intercourse

intercourse has been established only at distant intervals. Again, that it frequently results from one impregnation may be regarded as absolutely proven in those cases where from the presence of only one corpus luteum of pregnancy after a twin labour, we know that two children have been produced from the contents of one Graafian vesicle.

2. May not a second impregnation be established? This introduces the subject of superfœtation which will engage our attention further on.

3. Does a plurality of children result from the influence of either male or female parent in particular? The experiments of John Hunter upon the lower animals show the important agency of the female parent in regulating the number produced at a birth. The subjects of his experiments were two pigs. He deprived the one of one ovary and left the other uninjured. Intercourse with the male was permitted to both. The one that was left unharmed produced in all one hundred and sixty-two young while the partially spayed one produced only seventy.

seventy six This experiment while showing the great influence of the intact reproductive organs of the female, does not in any way prove that multiple generation depends on the female parent

As showing the influence of the male parent in the production of plural births we have a striking example in the case of the Russian peasant referred to on page 9 of this paper, and Campbell and Meriman also mention cases of men who have been parented by different females with twins and triplets on several occasions. As far as our present knowledge goes we can only say that the production of plural births may result from the influence of either parent.

Superfoetation

This term is applied to that condition in which a woman, already pregnant, is believed to conceive a second time, during the period of gestation already existing

At one time this was a universally believed doctrine, and it is only in modern times that we find its number enquired as well as friends In the great majority of

of plural births there are no reasons to justify any idea of a second impregnation but cases do present themselves which appear to favour the idea of the possibility of such an occurrence.

1. The expulsion of a blighted ovum, along with a fully developed child, has been brought forward as a proof of superfetation.

2. The birth of one fully developed and a second immature child has also been instanced as evidence in support of this belief.

Many writers on midwifery record instances in illustration of these anomalies. But in explanation of them it is by no means necessary to have recourse to the doctrine of superfetation. We have only to suppose that twins were conceived as the result of one impregnation, and that the progress of one ovum was arrested at an early stage of its development; the arrested germ is either at once expelled, or is retained in its blighted condition until the healthy foetus is born. and thus we arrive at a solution of the difficulty.

difficulty at once simple and satisfactory

3 We have known another class of cases, which this explanation would not account for, namely that in which twins have been born of different colours. Of this peculiar phenomenon there are several instances on record. The best example of this is the case recorded by Buffon. "In 1714 a white woman residing at Charleston, South Carolina was delivered of twins. One child was white and the other black. Such an unusual occurrence led to enquiry and the woman confessed that on a certain day, immediately after her husband had left her bed, a negro entered the room and threatening to murder her if she did not consent forced her to submit to his pleasure." Another case is recorded by M. de Boillon in 1821 of a negress who brought forth a negro and a mulatto child at a birth, and who confessed that she had permitted the embraces of a white man and of a negro the same evening. Another case appears to have

occurred

occurred in 1849 and is identical with the case recorded.

In these cases it must be conceded that two distinct impregnations occurred. And that the successful intercourse of one was followed by the successful intercourse of another. If this were all that was meant by the term superfetation then we need have no difficulty in believing in its occurrence. But.

4 We have on record instances where a woman after having given birth to one mature child, becomes in a few months the mother of another. Desgranges of Lyons relates the following extraordinary case. A woman was delivered on the "20" January 1780 of a seven months child. Three weeks after her delivery she felt the movements of another child and on "the 6" July 1780 five months and sixteen days after the first birth she brought forth "a second apparently fully developed child". Dr. Hutton tells us of a lady who on the 12th November 1807 was delivered of a strong male child; and on the 2nd February 1808

Transactions of College of Physicians London Vol 4 p 161

2 Lancet 1871

1808 of another boy as perfect and mature as his brother. Other similar cases have been recorded by various writers.

How are we to account for these startling facts? The supposition has been advanced that in these cases both children had been begotten at the same time, but that the tardy birth of one had been due to a slower development. This explanation however is even more difficult of belief than is the doctrine of superfetation itself. Again the existence of a double uterus has been brought forward as an easy way of accounting for the phenomenon. And this explanation is encouraged by the fact, that such an arrangement does frequently exist. In these circumstances it is believed that one chamber may be impregnated first, and the other at a subsequent period. Cases establishing this have been recorded by Madame Bowen and by Dr. Harris Ross of Brighton in his graduation thesis.²

In these various ways we can account for many cases of apparent superfetation

but

but still cases remain where the uterus has been proved to be single, and yet one birth has taken place many weeks after a former one. In these cases we are I think bound to admit, that we have no way of explaining the phenomenon away. and must suppose that during the early months of pregnancy, the closure of the os uteri is not in all cases so complete as was supposed to be the case; and that when the ovum already in possession is not implanted in such a way as to block both Fallopian tubes. a second impregnation may possibly take place at any period up to the third month, when the decidua vera and reflexa unite.

Section IV Pathology

As the phenomenon of plural birth is to be regarded as a departure from the normal course of occurrence, it consequently involves structural and functional adaptations which would not otherwise exist. The presence and integrity of every structure, and the perfect and harmonious operation of every function is the standard condition of normality; and all deviations from that standard - whether of excess or diminution, - constitute an imperfect condition and must disturb in a varying degree the harmony and perfection of the whole.

A 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 even a series of symptoms are usually occasioned by the unusual pressure upon the surrounding parts

When - from the presence of a plurality of children - or from other causes of special enlargement the uterine tumour becomes exaggerated in size, the symptoms which

Result

results from the enlargement become more marked and distressing Vertigo. Dyspnoea. Palpitation of the Heart Tickness. Compression of the Bladder. Dropsy and Albuminuria are among the serious results of pressure from an overdistended uterus, and may frequently so endanger life as to call for serious consideration as to the necessity of interfering with the further progress of the pregnancy. This matter will be further referred to when we come to discuss the treatment of plural births. But the increased distension of the womb also begets a greater liability to hemorrhage after confinement owing to the indisposition of the womb. to contract firmly after undue distension

2 The larger placental surface which separates from the uterine wall. in the case of plural births is also a source of increased danger from hemorrhage, and thus diminishes the safety of the mother

3 The production of plural births is a greater invasion of the vital powers of the mother. This statement proceeds on the simple principle of supply and demand

Woman is normally uniparous: consequently in plural births the demand exceeds the supply and the effects are often apparent both on the mother and offspring. It is a matter of common observation that females - except those of most robust type - rarely go to the full term in plural pregnancies.

4. Dangers. - Common to all pregnancies - are more liable to occur in plural births, and the power on the part of the mother to resist them is diminished. All statistics on the subject show that the chances of recovery of women giving birth to two or more children are much less than those of the mother of a single child. Dr. Collins states the ordinary proportion of deaths of women giving birth to twins at 1 in 20 whereas with single children a death does not occur once in four times that number!

B Pathology in relation to the Children

1. As the number of children increases so does the chance of arriving at maturity lessen to each. If in plural births the mother suffers from too great a demand

demand for nutriment. As do the children suffer from an insufficient supply of the material. The size of the children produced at a birth usually corresponds with the number born, that is the size of each is diminished as the number is increased. 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 are more frequently reared than triplets and the probability of triplets surviving exceeds that of a larger number.

2. As a plurality of children suffer from diminished space, it is natural to suppose that the development of more than one child in utero may be interfered with by mechanical obstruction. I am not aware that this cause has ever been assigned as an influence antagonistic to the full development of a plurality of children, but it would appear to be a not improbable cause
of

of arrested development. It is one of the first truths of physiology, that pressure or confinement even to an inconsiderable amount arrests the development of the part affected. As we presume from the size and shape of the uterus, - as well as from the fact that woman is - as a rule, - uniparous - that it was only intended to contain one child at a time, so we conclude that any increase of its contents must suffer from lack of adaptation which it cannot afford.

3 The presence of a plurality of children may in itself be a cause of modified or arrested development by the mechanical interference or contact of the children themselves. There can scarcely be any doubt that to this cause many of the instances of monstrosities and blighted ova which come under notice from time to time may be referred. The subject of monstrosities will be discussed separately.

4 The presence of a plurality of children places them in a position of greater
risk

risk at parturition. An examination of statistics painfully confirms this statement. Dr. Churchill states that out of 941 cases of twins 482 children were lost or about one in four; and out of twelve cases of triplets eleven children were lost, or nearly one in three. This mortality enormously exceeds that in cases of single births which taken all over does not I think exceed one in twenty.

Double Monstrosity

The subject of monstrosity has always attracted much attention and gives rise to many opinions as to their nature and origin. A great amount of ingenuity has been expended, and many elaborate hypotheses have been propounded, which while giving evidence of the ingenuity of the theorists cannot by any possibility be regarded as satisfactory. This result is to a large extent due to the mistake made by most men of attempting to reduce to principle and law a condition of which the essential character is a defiance of all law.

Over

Our present enquiry does not involve consideration of the phenomena of monstrosities, it only includes a reference to that anomalous formation which has been called Double headed.

With regard to these then - In each of the individuals we can trace more or less distinctly the parts of two children. In one class of cases we have the bodies and limbs of two distinct children well developed, with a comparatively slight bond of union between them. This union is usually effected at the back, sides, sternum, or abdomen. Such individuals do not often survive their birth, but instances have occurred in which they have continued to live for many years. Of this condition the best known examples are the Hungarian sisters, the Siamese twins and the African twins. In all recorded cases the individuals have been of the same sex.

The Hungarian sisters were born in Saxony in the year 1701. They were united at the lower part of the loins and oses. Their uterus was all

double, except that the two recta and two vagines united at their extremities opening into a common anus and vulva. The one was robust, the other delicate. They were affected separately by hunger, the one slept while the other was awake, and they menstruated at different periods. They died almost at the same moment at the age of twenty one.

The Siamese twins were born in 1811. Their bodies were connected "by a band about" "four inches long and eleven inches in" "circumference situated at the lower end of" "the sternum, involving the ensiform cartilage," "and possessing at its lower free an umbilical" "vein." They were both affected by hunger simultaneously, both preferred the same kinds of food, and were satisfied with the same quantity and at the same time. Both slept at the same time, and the one could not be aroused without awakening the other. The vascular system of each was distinct.

The African twins were exhibited some years ago in this country. They were females joined

'Ambrion Paris works Johnson 1678 p 587

joined by a bony union of the two sacra
 There was only one anus which however
 opened a short way within the orifice
 into two canals. The sisters were apparently
 strong and healthy.

In a second class of cases we have the
 union of a perfect with an incompletely
 developed individual. One of the twins
 at an early stage may become arrested
 in its growth, and form a parasite hanging
 from its brother or sister as the case
 may be. An extraordinary instance of
 this condition is a case reported by
 Ambroise Pare' who tells us "that in the"
 "year 1530 there was a man to be seen"
 "at Paris out of whose belly another, perfect"
 "in all his members except the head, hanged"
 "forth as if he had been grafted there. The"
 "man was forty years old and he carried"
 "the other implanted or growing out of him"
 "in his arms with such admiration to the"
 "beholders that many ran very earnestly to"
 "see him". This record might have been
 received with scepticism - as many of
 Pare's statements can scarcely be credited -

but

¹ *Medical Chirurgical Transactions* vol 1

² *Erasmus Wilson Lectures February 1887*

but for the fact that other cases have been recorded more recently, the correctness of the record of which are beyond suspicion. A very similar case of an Indian youth is at the present time on exhibition in London of which an interesting account is given in the British Medical Journal for 25th February 1888.

In a third class of cases an imperfectly developed foetus has been found within a perfectly developed individual. A case is reported of a child, who had a tumour in the abdomen which gradually increased in size until the death of the child which occurred in its ninth month. The abdomen was found to contain a cyst enclosing an imperfectly developed foetus.

Quite recently Mr. Bland Sutton has called attention to the fact that congenital sacral and Coccygeal tumours are frequently cases of parasitic foetus? Mr. Jones reports a case of such a tumour removed during life and which was found to be attached to the Coccyx and lower part of the sacrum. The tumour was composed of
skin

1 Pathological Society Transactions Vol 33 p 285

skin possessing hair, with developing sebaceous and sweat glands; masses of fat, cysts containing mucoid material, portions of intestines, and bones covered with cartilage. Standing out from the growth were five ripple like processes, resembling rudimentary digits. These - and particularly the largest exhibited contracted movements which were increased by stimulation with cold.

Cases. In many cases of double monstrosity I think we may be satisfied with the theory already indicated, namely that these cases are to be looked on, as being originally cases of ordinary twin conception and that the various combinations which they assume are the result of a subsequent process. It would seem probable that in an early stage of gestation owing to an imperfection of the investing membrane of the ova - which condition we know does frequently exist - the two embryonic structures come into contact. The formative power in the two bodies is strong and vigorous; the contact

remaining

remaining undisturbed becomes more intimate; the vascular system being appealed to anastomoses of vessels take place and permanent adhesion is the result.

But while this theory seems satisfactory in cases of the first class where in fully developed individuals fusion of some one part has formed a bond of union it cannot be held to satisfactorily account for many of the cases of parasitic fœtus. To account for these Mr. Bland Sutton's argument in favour of the development of double embryos from the subdivision of one ovum is worthy of careful consideration. He first brings forward evidence that in the lower forms of the animal creation it is possible by artificial subdivision of the first mass of blastomeres to multiply the number of embryos. He instances Haeckel's experiments on the eggs of the *Cystellodes rigidum*, and from these he deduces the following conclusions

- 1 Development continues in the divided pieces
- 2 The smaller the piece, the slower is the growth

growth of the larvae

3 The smaller the divided portions, the forming larvae tend to be more incomplete, and incline so much the more to monstrosity. From these facts and from observations on double developments from a single ovum, in worms, btrachians and fishes he argues the probability at least of the development of two embryos from one ovum in the mammalia. He assumes that double monstrosities are the produce of one divided ovum, and in this way imperfect development may be produced. One division may be much smaller than another, and thus we would have the smaller imperfect parasit- produced. In support of his general argument, in addition to the experiments referred to, he brings forward the following as facts:

1 That each embryo in a double monstrosity is smaller as a rule, but never larger than a normal single foetus. If he says "the duplicity" "were the result of the fusion of two ova the condition would not be so constant."

{Against this however the same rule may be laid down as regards ordinary plural pregnancies that

British Psychological Journal Vol 3 pp 164-172

that each foetus is as a rule smaller and
as far as I know never larger than a normal
single foetus.)

2 That double monstrosities are invariably of the
same sex. From these facts he holds "it is"
"fair to infer that it is not improbable that"
"when twins occur of the same sex, they are"
"the product of a single ovum." Parasitic
"foetus and supernumerary limbs in the"
"sacred region may be regarded as suppressed"
"embryos the anterior and posterior originating"
"from a single ovum."

Section V Obstetrics of Plural Births

We now approach the most important part of our subject. The Anatomical and Physiological relations of plural births cannot fail to interest the scientific enquirer. Indeed there are few phenomena which present a more interesting field for investigation. But there are higher considerations than those of scientific curiosity or personal gratification to invite us to the study; the enquiry which has engaged our attention must furnish us with principles to guide us in our treatment of this condition.

1 As to the signs and symptoms of Plural pregnancy prior to Labour.

The signs and symptoms which have been enumerated by obstetric physicians do not furnish us with any positive indication on which we can absolutely rely, of the existence of this condition. They are to a great extent fallacious, and certainly equivocal. Undoubted evidence of the presence of a plurality of children can seldom be obtained before

before labour commences, and only rarely before the birth of the first child. The diagnostic marks which are offered for our guidance are

1 Increase size of the abdomen. This can never be recognized as a certain indication of plural pregnancy. It is of course at once conceded that the presence of more than one child does cause an increase in the size of the abdomen. But the enlargement does not always depend on the same cause. It may be due to Hydramnios. Besides "increased size" and "enlargement" are terms too indefinite to be relied on in accurate diagnosis.

2 That in plural pregnancies the uterus takes a shape peculiar to the condition. It is described as being broader than in cases of single pregnancy, and it has been affirmed that a prominence can be made out on either side of the fundus uteri, and that there is a depression in the center. This characteristic is however by no means always observable, and even if it were might be due to other causes

As for example a transverse position of a single child, - irregular contractility - of the muscular fibres of the uterus itself, or the presence of fibroid tumours,

3 Consciousness on the part of the mother of two distinct movements at different parts of the uterus with some women this sensation is of value from a diagnostic point of view; but in the very great majority of cases it is the experience of all obstetricians that the sensations of a woman during pregnancy are not to be relied on; for in most cases such representations are found ultimately to be quite erroneous.

4 Auscultation has been recommended and is undoubtedly the most certain way of detecting the presence of more than one child. There are many difficulties in the way, but still with all its hindrances auscultation has frequently detected the presence of more than one child in the womb. The pulsations of the two foetal hearts are not always synchronous and they may thus be distinguished. Or the heart sounds may be heard with equal intensification

at two separate and comparatively distant points

In many - indeed in most cases - while we may have a strong suspicion that we have to do with a case of plural pregnancy, we will be baffled in our attempts to test with any degree of certainty before labour begins, that plural pregnancy does exist; but we are consoled by the knowledge that - where there have been no abnormal symptoms during the later months of pregnancy - the failure involves no extra danger to either mother or children, as success would not in any degree alter the plan of treatment which I shall now endeavour to indicate

When summoned to an ordinary case of labour there are certain rules of management which have been taught us by the accumulated experience of obstetric practitioners and which all obey, being fully convinced of their propriety

The management of the birth of the first child in a case of uncomplicated twin labour is precisely the same as that of the birth of a single child All are agreed

agreed on this point though much diversity
 of opinion exists as to the proper management
 of the second labour. Our patience is often
 very much taxed, - for twin labours are frequently
 very tedious not always on account of actual
 feebleness of the uterine contractions (though
 owing to the great distension the muscular
 contractions often are less energetic) - but
 owing to the fact that the action of the
 muscular force is modified by the presence
 of a second child, causing it to act
 indirectly through the child which is placed
 higher in the uterus or to the lower, instead
 of directly as in a single labour. After
 a longer or shorter period the child is born,
 without any other peculiarity in the process
 of its birth. Double ligatures are applied
 to the umbilical cord and the connection
 with the mother severed. If up to this
 stage we have been ignorant of the presence
 of another child, we shall now be apprized
 of the fact, by the persistent large size
 of the uterus. On passing the hand over
 the surface of the abdomen, we find that
 the uterine tumour has not materially

diminished

diminished in size. The fundus can be felt as high as, or higher than - the umbilicus. Now we are almost certain that we are at a case of plural labour, and absolute certainty can be obtained by a vaginal examination. At the os, the finger will detect the presence of the membranes of the second child. In a protracted case we will find the head presenting, there is soon a return of uterine contractions, and the second child is born in exactly the same way, and with as little interference on our part as the first. Another examination should now be made to determine the presence or absence of a third child. If there should be another its presence will be indicated by the same signs, and its birth is to be conducted on the same principles.

Having ascertained that all the children are expelled, the placentae are to be removed in exactly the same way as in an ordinary single labour, ergot administered if the contractions of the uterus are faulty and a binder applied. As to the interval between the birth of the children

Children it is seldom less than ten minutes and seldom more than an hour. In 211 cases of twin labors collected by Collins 162 were delivered of the second child within half an hour, 183 within the first hour, and only 28 were left after that period.

If the second child be not expelled within half an hour or one hour, the question presents itself what are we to do? Are we to resort at once to artificial interference, or wait for a longer period? These are questions which have even puzzled obstetricians and to which answers widely differing from each other have been given. Some of the older writers taught that it was necessary at once to interfere; others advised us to wait patiently, and not to attempt artificial delivery. Denman says "we ought to wait for four hours at least after the birth of the first child before we deliver the patient by art of the second child." Drs. Burns and Hamilton suggest about an hour. Collins recommends that after the lapse of half an hour the membranes of the second child should be ruptured; and that if this fails to bring on sufficient uterine action

we should in the course of two hours longer
turn and decline by the feet. Sir James Simpson
held a similar view.

These varied opinions illustrate the utter
impossibility of laying down any hard and
fast rules which shall be applicable to all
cases; and the attempt on the part of
practitioners to follow invariably precepts that
have been laid down for their guidance, as if
they were immutable laws, has been the
cause of much of the difficulty which has
attended the question, as to the proper time for
employing art to accomplish the delivery of
the second child. We are apt, then, to overlook
the many different circumstances which
distinguish different cases, any of which may
render a set rule of treatment, not only
unexpedient but even hazardous. To all
such rules of treatment it should be very
distinctly and emphatically premised, that they
only concern the broader outlines of treatment
which the circumstances of each individual
case alone must indicate, and that laws
are not invariably to be adopted, because they
have been formulated, but that to a very
large

Large extent the individual practitioner must exercise his own judgement and be "a law unto himself"

Having now mentioned the conditions on which any such system of treatment is to be received, we are in a position to examine a little more closely, the suitable treatment of the various departures from the picture we have already attempted to draw, of the normal course of twin labours.

A Case in which there is simply delay with no other symptoms requiring attention when, on the birth of one child, a second is discovered, the attendants should be informed of the circumstance, and as a rule - if the mother is not under Chloroform - it is best also to inform her, at the same time giving her every encouragement as to the further progress of the case. If necessary a stimulant may be administered, and moderately firm pressure applied to the abdomen. We should then wait for at least half an hour, and absolutely refuse to interfere. At the end of that period if there is no appearance of a revival of uterine action, we should endeavour to
excite

excite contractions by carefully introducing the hand and rupturing the membranes. In a large number of cases, this interference will be successful, and nothing further will be required. Sometimes, this interference, however, has not the desired effect, and then it is advisable in the great majority of cases, after waiting an hour, to turn and deliver by the feet. If we delay interference longer the os uteri rapidly contracts, and renders delivery more difficult, and thus diminishes considerably the chance of the infant being born alive. The renewed dilatation of the uterus necessary to effect delivery at a later period must also be a cause of increased danger to the mother from exhaustion, as well as by the possible admission of septic germs during the additional necessary manipulations.

B Cases in which there is delay, accompanied by conditions requiring attention

- 1 When the first labour has been difficult or protracted. In such a case a careful examination should at once be made to ascertain the position of the second child. In many cases where there has been

been malpresentation of the first child requiring the interference of art, we shall find the second child presenting normally and in such cases we should not interfere but be guided by the rules already laid down. If the second child should prove to be a footling or breech presentation there is as a rule no occasion for interference.

(2) When however the trunk or superior extremity presents delivery should be effected without the delay which is permitted in simple cases [Even in such cases considerable delay is not necessarily followed by bad consequences though certainly no advantage is gained by waiting. I recollect at one time, while practising in the Shetland Islands, being sent for to attend a woman living at a distance of thirty miles from my house. On my arrival I found that she had been delivered twenty eight hours previously of a female child, and that she had been suffering from moderate labour pains for twenty two hours before my arrival. On examination I found a shoulder presentation and with some difficulty turned and delivered her of a medium sized male child alive. The

woman

woman recovered without a bad symptom. This case is mentioned not as an argument in favour of delay but as showing the good results that may be hoped for, even when through unavoidable circumstances extraordinary delay of interference has occurred]

3 When hemorrhage, Convulsions, or other dangerous symptoms supervene. Here the rule is emphatic. The uterus must be emptied of its contents as quickly as possible, and the patient is to receive that treatment which the presence of the same complication in a single birth would demand.

C Cases of Complex Twin Labour.

Two sets of membranes may be recognised presenting at the same time, and in such a case we must do the best we can to preserve intact those which protrude latest. It is of the greatest importance that the membranes of the second child should not be ruptured before the birth of the first. Even in such a case, with very small children or a roomy pelvis it may happen - from the head of the second child fitting into the hollow behind and below the occiput of the first. - that the
unaided

Unaided efforts of nature will effect delivery when possible the head of the child presenting last should be pressed back while forceps are applied to the first presenting head. If this manoeuvre prove impossible, we must endeavour to introduce the perforator past the first head, and perforate the second, as as to reduce the bulk of the obstructing part.

A still more serious condition of matters is that commonly called "Locke's Twins" Here we have the chin of one - presenting by the foot or breech, - locked in the chin or occiput of the second presenting by the head. In such a case it is sometimes possible to press back the entangled parts above the brim. If we can succeed in this then an endeavour must be made to retain the head of the second child there while an assistant makes traction on the body of the first child. If we succeed in our efforts at disentanglement the difficulty is over; but too often we will fail, and then we have no resort but to bring them down again as far as possible, and either decapitate the first child or perforate the head of the second. In most cases the first alternative
will

will be the best, as from the pressure on the umbilical cord, there is a much greater likelihood of the life of the first child being sacrificed in any case. The body at once comes away and the head recedes into the uterine cavity or is pushed back. Forceps can now be applied if necessary to the head of the second child. The head of the first presenting child must then be removed by the aid of Forceps or if that is impracticable - as it sometimes will be - by the Cephalotribe.

D Treatment of Double Monsters.

It is evidently impossible to lay down any general rules which would be applicable to these cases as the different forms of Monstrosity vary so much. In all cases it must be borne in mind that we have no more right to sacrifice life unnecessarily in a case of monstrosity than in an ordinary twin or single labour. Some may be born alive without any interference where the children are small and the maternal parts roomy, or where the attachment is so lax or there is such disproportion in the size of the children as to allow of one head advancing before the other. In other cases when the monster becomes

becomes jammed we must remove the obstructing head or viscera as circumstances dictate.

I cannot conclude this paper without some reference to the difficulties and anxieties the practitioner often has, in the treatment before labour sets in, of many cases, where, from the various symptoms we have reason to suspect plural pregnancy although we are unable to form a positive diagnosis. In many such cases we have pressure symptoms, which, beginning early become long before the ordinary termination of pregnancy so serious as to force the practitioner very earnestly to consider whether it is not his duty to take measures to terminate the pregnancy. Fortunately as we have remarked already, nature frequently comes to our assistance and terminates the pregnancy at the seventh or eighth month. As a good example of such cases I think I cannot do better than record the history of one such case which occurred in my practice this year, and which I had an opportunity of watching very closely all through the pregnancy.

A lady aged 28 of good constitution
primipara

primipara, had last menstruated on
 the 11th September 1884. During the earlier
 months of pregnancy she suffered much
 from sickness which continued very
 constant until the sixth month. At
 that time she was much bulkier than
 usual, and began to suffer from irritability
 of the bladder. Shortly after this her ankles
 began to swell, and this swelling gradually
 extended up the legs. The urine was
 now examined and found to be normal
 in quantity and quality except for the
 presence of some bladder mucus. (After this
 the urine was examined every week.) Not-
 withstanding rest and general treatment
 the condition continued to get worse, and
 she complained that the irritability of the
 bladder was greater when she was lying
 down. On the 10th April albumen to the extent
 of $\frac{1}{8}$ was found in the urine, and a few casts.
 The daily quantity passed would be from 16 to 20
 ounces. Specific gravity 1025. The dyspepsia
 continued to increase, and the quantity of
 albumen also increased with gradual
 diminution of the quantity of urine passed.

On

On the 2nd May she had some labour pains which however passed off. On the 9th May I found the face & hands slightly swollen, and the backs of the legs & thighs very oedematous. The urine had now decreased to about eight ounces in the twenty four hours of high specific gravity & contained about $\frac{1}{3}$ albumen. She had still four weeks of her pregnancy to run & the general condition was such that I thought the pregnancy should not be terminated. On this point I determined to have a consultation; but fortunately nature stepped in to the rescue, labour pains began on the 10th and on the morning of the 11th May she was delivered of twins boy and girl without any further complication and since then the kidneys have quite recovered.

In such cases when putting aside the risks from convulsions it would be interesting to know how long this state of passive congestion of the kidneys could be tolerated without laying the foundation of chronic disease. Such an enquiry, however, would require the presence of far more opportunities

J

of observation than I possess

In many cases undoubtedly nature comes to our assistance as in my case & terminates the pregnancy, but in cases where this does not take place and where the results of pressure, - after all possible precautionary treatment has failed, - continue to go from bad to worse, I think the practitioners duty would be to induce premature labour.