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O U T L I N E S  
*Saml* OF THE  
THEORY AND PRACTICE  
O F  
M I D W I F E R Y.

B Y  
ALEXANDER HAMILTON,  
M. D. F. R. S. EDIN.' ✓

PROFESSOR OF MIDWIFERY IN THE UNIVERSITY,  
AND MEMBER OF THE ROYAL COLLEGE OF  
SURGEONS, EDINBURGH.

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ARTE NON VI.

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A NEW EDITION.

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## ADVERTISEMENT.

SINCE the publication of the *Elements of Midwifery* in 1775, continual reflection, and constant practice, have produced many changes in different parts of them.

THE first rude production of an author unused to publication, requires frequent revisal and copious alterations; but, in another view, this WORK is materially different. In the earlier stages, the Author imagined, that Midwifery was in a great measure Empirical; and that its principles were few, vague, and uncertain. His opinions were not peculiar; and if he erred, he erred with the greatest and most successful practitioners. But he has since found, that, though in many respects uncertain, the Theory of Midwifery deserved his attention, as it might often direct the Practice; and that its imperfections were not greater than those of the Theory of Medicine in general, which have not been thought of sufficient consequence to preclude the attention of physicians.

With these views, he has endeavoured to give at least the rudiments of a complete system; and, as  
the

the Work was therefore materially changed, it was common justice to the world and to himself to give some information of this change.

But, independent of this principle, the former Title would not now have expressed the present object and design; so that a work different in matter ought also to differ in form.

EDIN. Aug. }  
1783. }

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x INTRODUCTION.

How few are the modern instruments, in comparison of those employed by the ancients! How simple is their construction! And how seldom is recourse had to them! Of late a true spirit of observation has arisen, and been directed to the most important objects; every disease has been accurately distinguished from those which it more nearly resembles; and it may with truth be affirmed, that more light has been thrown on his subject, within these few years, than for above a century preceding. The late publications of Dr SMELLIE, Dr MANNING, Dr HULME, Dr LEAK, Mr WHITE, Mr MOSS, Dr DENMAN, Dr OSBURNE, and others, and the elegant plates of Dr Hunter, may be considered as valuable acquisitions to the practice of midwifery.

With regard to the plan of the following work, the same method has been observed which the author pursues in his course of lectures. As this plan has some peculiarities, it will perhaps be necessary to premise those reflections which first gave occasion to it; and as they arise from the nature of the subject itself, they will form no unsuitable introduction.

Nothing is more conducive to the proper method of teaching an art, than to consider its principle object, as well as its immediate relations to those that are most intimately connected with it. By this means a distinction can be made between those parts to  
which

which attention ought to be chiefly directed, and others which would rather embarrass than assist our researches.

If, for instance, the several parts of medicine be considered, their ends will be found to be essentially different; and, of consequence, the means by which these ends are accomplished will be frequently opposite. This is particularly illustrated by a little reflection on two different branches of the science, viz. the practice of physic, and of surgery, strictly so called. In the first, the nature of the disease can only be collected from symptoms; which, as the same symptoms proceed from different and even opposite states of the body, must sometimes unavoidably lead into error; and even the symptoms themselves are often so contradictory, that nothing can be collected from them; so that the physician is obliged to proceed on some very vague and distant analogy. Though these difficulties be surmounted, the effects of remedies are still uncertain; the real effects of many are not known; and, as they operate, not on an inanimate machine, but on a system, in which, from any change, motions are excited frequently opposite to those expected, it is not surprising that the expectations of the physician are often baffled. Thus the practice of physic cannot be regulated by certain rules; it depends much on the state of the  
body

body in health, and the very different changes introduced by disease: To study it properly, all these ought to be considered; and it is this part which is commonly called the Theory of Medicine.

In a subject so difficult and obscure as the animal oeconomy, it is not surprising that the practitioner should be often embarrassed; and that instead of certainty, he should sometimes be obliged to determine his conduct by probability, or by a loose and uncertain analogy.

But the views of the surgeon are less obscure; he is often confined to cases where manual dexterity *only* is necessary, and has, very generally, the objects of consideration subjected to his senses; and, where they are out of the reach of sense, the symptoms are more plain, the inductions fewer, and the conclusions more certain. In this part, then, theory is less necessary, and only useful as it seems to connect the several facts: Practice is particularly proper to acquire that firmness and constancy of mind, and that manual dexterity, so essential to the success and character of a surgeon.

Midwifery, which may be defined "The art of facilitating the birth of children," is to be considered in much the same light as the other parts of surgery. Theory is less essential to it, as it chiefly consists in an operation which requires a dexterity, only to be learned

learned by practice. But, taken in a more enlarged sense, Midwifery may be defined, "The art of facilitating the birth of children, and of managing pregnant and puerperal women." A part of it, therefore, has still a relation to the practice of physic; and, as such, must be involved in the same difficulties and obscurities.

In this view, then, two objects are chiefly to be attended to:

I. The operation itself, with every thing relative to it.

II. The state of the woman after delivery.

To obtain a proper knowledge of the first of these, it is necessary that the structure and functions of the parts themselves, the several changes which they undergo, and the causes which may prevent or retard either conception, or a proper delivery, should be known. The two first of these comprehend the Physiology of Midwifery; the last, what may be called the Pathology.

An attention to the structure of a machine on which we operate, is certainly a point of the greatest consequence; and it is particularly so in the obstetrical art, as much of the practice depends on a proper knowledge of the parts; And it is not only the anatomical consideration of every part, but the relations of one part to another, their distances and their inclinations

nations, both with respect to each other, and to other parts of the body, that are absolutely necessary to be attended to. The consideration of their several functions is not so essential, as it contains only hypotheses, which, though sanctified by the authority of great names, are often trifling, generally insufficient and unsatisfactory. These, however, as they are immediately connected with the subject, have not been omitted. Several opinions with regard to the Theories of Generation and Conception, have been concisely mentioned. This may be called the Physiology of Midwifery; for if no disease comes on, a natural delivery at full time may reasonably be expected. But there are many Topical Affections of the parts in the impregnated state, which will influence delivery, either by inducing it prematurely, or preventing it altogether. Many diseases may also supervene in the impregnated state, which will have the same effect; these, therefore, must be considered, and the most approved method of relieving them pointed out. Having thus laid a proper foundation, the Operation itself, with all its material variations, comes next to be explained. This finishes the first, and not the least important part of MIDWIFERY, and concludes the present work.

The second part, or the management of lying-in women, and also of new born children, should fall next to be considered.

The management of puerperal women, from the late labours of some ingenious accoucheurs already referred to, may now be conducted on a more certain footing; the different diseases, for instance, may be distinguished with greater accuracy, which is a chief point in conducting the cure. The management, where there is no particular disease, is now directed by an attention to nature, unencumbered by refinements built on fallacious and uncertain theory. This part the author proposed for the subject of a second volume; but the late publications, already mentioned, have in some measure anticipated the intention.

THE HISTORY OF THE  
LITERATURE OF THE  
NINETEENTH CENTURY

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THE HISTORY OF THE  
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NINETEENTH CENTURY

E L E M E N T S

O F

M I D W I F E R Y.

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P A R T I.

ANATOMY AND PHYSIOLOGY.

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C H A P. I.

*Of the* P E L V I S.

THE human skeleton is divided into the Head, Trunk, and extremities. The Head includes the Cranium and Face. The Trunk consists of the Spine, Thorax, and Bones of the Pelvis. The latter, which include also part of the Spine, are the more immediate objects of the Accoucheur's attention.

The *Pelvis* is an irregular cavity, more nearly approaching to a cylindrical than any other figure; and is chiefly composed of the *Ossa Innominata*, the

*Os Sacrum*, and *Ossa Coccygis*. The two ossa innominata constitute the lateral and anterior parts; the os sacrum, and small range of bones called the *coccyx*, form the posterior part. This bony circumference includes a space which represents the figure of a basin, from whence the name PELVIS is derived.

To have an accurate knowledge of the Pelvis, it is necessary, first, to describe separately the different parts of which it consists, and then to consider it when these parts are united.

## SECTION I.

### *Of the Parts of the Pelvis separately.*

THE *Ossa innominata* are two large expanded bones, which form the sides and fore-parts of the pelvis, and inferior lateral parts of the abdomen. In infancy and childhood, each of these bones is divided into three distinct parts by intermediate cartilages; and tho' afterwards the bones become united, and every appearance of former separation is nearly obliterated, the names by which they were distinguished in younger years are still retained.

I. The *Os Ilium*, or Haunch-bone, is the superior and largest portion of the innominatum. It extends from the semicircular ridge at the superior,  
part,

part, downwards and backwards as a transverse section of two-fifths of the *acetabulum* or cavity which receives the round head of the thigh-bone, and forwards to a little below the projection or ridge which forms the brim of the pelvis. Hence a small portion of the *ilium*, only, belongs to the pelvis, the expanded part being placed entirely without the brim. The different parts of the *ilium* are, the superior semicircular ridge or spine, giving rise to several inequalities or prominences, termed *spinal processes*; two broad surfaces, improperly named *dorsum* and *costa*; the small irregular surface by which it is joined to the sacrum posteriorly; the lower, thick, narrow part of the acetabulum; and, the ridge or projection at the inferior anterior part.

2. The *Os Ischium*, or Seat-bone, called also Huckle or Hip-bone, is the inferior lateral portion of the *os innominatum*. Its figure is very irregular, and its extent may be marked by a line drawn through near the middle of the acetabulum.

The several parts of this bone are, the Body, Tuberosity, and Ramus. The Body forms the lowest and greatest part of the acetabulum; the small branch, or Ramus, makes up four-fifths of the great hole common to this bone and the Pubis, called *foramen ovale* or *thyroides*; and the inferior bump, flattened by pressure, is the Tuberosity which supports us in a sitting posture. The *tuber* is nearly cartilaginous at birth, and afterwards becomes an *epiphyse*.

3. The

3. The *Os Pubis*, or Share-bone, which makes the anterior middle part of the pelvis, is the smallest portion of the os innominatum.

Its several parts are, the Body, Angle, and Ramus. The body is the superior outer part, by which it is joined to the os ilium: on this is a remarkable crista, which forms part of the brim of the pelvis. The Angle runs downwards and forwards; and has a rough unequal surface, for the firm adhesion of the thick ligamentous cartilage that connects the bones of the pubes, which is considerably thicker and of a softer texture in females than in males. This articulation is called *symphysis pubis*. The deficiency of bone below, or space between the two rami, is termed *arch of the pubes*.

The three portions of bone just now described, compose the os innominatum of each side; which are connected posteriorly at the sacro-iliac symphysis, and anteriorly at the symphysis pubis, by thick cartilaginous agglutinations. These are strengthened in a very particular manner by strong ligaments at the posterior symphysis, and a double capsular aponeurosis anteriorly\*, which seem to render them incapable of separation, or of any considerable relaxation by the impulse of labour. The bones and cartilages are, however, liable to be softened by disease, and the

\* *Vide* Dr. Hunter's description of the Articulation of the Pubes, London Medical Observations and Inquiries, vol. ii. p. 333.

the ligaments relaxed, *viz.* from ricketty disposition, rheumatism, and from debility in consequence of fevers and other disorders. The bones may also be fractured, or the articulations forced by mechanical injury, as from falls, bruises, &c. and suppurations may ensue from internal causes as well as accidents.

The posterior part of the pelvis is made up of the *Os Sacrum*, or Rump-bone, and its extremity the *Coccyx*.

The *Os sacrum* called also *Os Basilare* by the ancient, from its use in supporting the trunk, is, in young subjects, composed of five or six peices, with intermediate cartilages. It has two surfaces, an external and internal: the former is rough and convex; the latter more smooth and concave, marked with several transverse lines, the remains of the intermediate cartilages which formerly connected the several pieces of bone. The flat side is bent, first downwards and a little backwards, then considerably forwards. The *sacrum* is of a spongy cellular texture; and, in proportion to its size, the lightest bone of the body. Its figure is triangular, having the superior part for the base, with the apex downwards, gradually becoming narrower terminates in its appendage the *Coccyx*. The superior part, or base, anteriorly, has a sharp ridge, which makes the posterior part of the brim of the pelvis. Through the holes by which this bone is perforated, many nerves are transmitted. Those

of the anterior superior part admit some of the largest of the whole system. The *sacrum* is articulated above to the last vertebra of the loins, in the same manner with the true vertebrae. Laterally, it is joined to the *ossa innominata* by a deep irregular surface, where it forms the *sacroiliac symphysis*, which makes an immoveable *synchondrosis*; and below, it is connected with the *coccyx* by means of strong ligaments. It is securely guarded from external injuries, by the thick muscles that cover it behind, and by the strong ligamentous membranes which closely adhere to it.

The *Os Coccygis*, which is placed at the extremity of the *sacrum*, forms the lower posterior part of the pelvis, and inferior terminating point of the spine. Its figure resembles an inverted pyramid. Like the *sacrum*, it is bent downwards and forwards; having an external convex, and internal concave, surface. It consists, generally, of four pieces of bones, with intermediate cartilages which admit of considerable motion of the bones, in a direction most commodiously adapted for the enlargement of the inferior capacity of the pelvis.

In children, the *coccyx* is almost wholly cartilage; towards the decline of life, the interposed cartilages begin to ossify: and at length the separate pieces are united, and become one bone with the *sacrum*. The immobility of the *coccyx* is not, however, the only reason why women advanced in life have commonly difficult and laborious births: various reasons also con-

cur, as well as the driness and rigidity of those parts that are softer and more pliable in younger years.

The parts common to the Pelvis are, the *Acetabulum Offis Femoris*, *Foramen Ovale*, great *Sacro-sciatic Notch*, and the *Brim*.

In the recent subject, this cavity is lined with the *periosteum*, with cartilages, tendons, membranes, muscles, and cellular substance. Internally it is covered chiefly with the *iliacus internus*, the *psoas*, and the *obturatores muscles*; externally, by the *glutæi*, tricipital and pyramidal: the abdominal muscles, with the *peritonæum* and common integuments, defend it before; and the bottom is shut by the *musculi coccygæi*, the *sacro-sciatic ligaments*, the inferior part of the *rectum*, its *sphincter*, and the integuments of the *perinæum*. These parts are chiefly supplied with nerves by the anterior and posterior crural, the obturator, and those of the *sacrum*; with blood-vessels, by the *iliacs*.

The pelvis is articulated with the spine at the superior posterior part, and with the *ossa femorum* below. Its principal uses are, to defend those parts contained in it from external injury, to support the uterus during gestation, and to give passage to the child at birth. It also supports the trunk and inferior parts of the body, forming the intermediate connection between them; and is the great centre of motion of the whole machine.

## SECTION II.

*Of the Shape and Dimensions of the Pelvis.*

THE cavity of the pelvis, or space included within the bones, is of different shapes in different subjects; and has been supposed by different authors to approach more or less to an oval, elliptic, triangular, or circular form. Its circumference ought to be somewhat between an oval and a circle, and to measure nearly one-fourth of the height of the body.

The lesser or true pelvis may be distinguished by the *brim*, or superior aperture; and the *bottom*, outlet, or inferior aperture. Considered in this point of view, the diameters of its brim and bottom, the width, depth, and form of its cavity, must be carefully attended to.

At the brim, the largest diameter of the pelvis is lateral, the next to it diagonal, and the smallest from pubes to sacrum. A well-formed pelvis ought to measure nearly five inches and one-fourth laterally; four inches and one-half, or four and three-fourths, diagonally; and four inches and one-fourth from the top of the pubes to that of the sacrum. These proportions are reversed at its inferior aperture, where the pelvis is nearly an inch wider from the lower part of the arch of the pubes to the point of the coccyx, when  
that

that bone is on the stretch, than it is from side to side: For the distance between the tuberosities of the ischia is about four inches, or four and one-fourth only; and from the arch of the pubes to the extremity of the coccyx when stretched out, five inches, or five and one-fourth.

The pelvis at the sides is nearly twice as deep as at the fore-part, and almost three times deeper behind; viz. from the top of the sacrum to the point of the coccyx, when extended, six inches, four at the sides, and two only at the pubes. The upper and lateral parts of the pelvis, at the brim, are nearly perpendicular: but the anterior part is shallow; and the lateral openings in the recent subject are covered with membranous, muscular, and ligamentous parts, which yield with the coccyx to the pressure of the child's head, and form a concave nearly equal to that of the sacrum.—From this construction, added to the curve and concavity of the sacrum, and mobility of the coccyx, the bottom is considerably more capacious, and somewhat more circular than the brim.

A line from the symphysis of the pubes, to the junction of the two last vertebræ of the sacrum, is horizontal. And a line that bisects this horizontal line, as well as the two diameters of the brim, makes the axis of the pelvis; and, if produced, will pass through the umbilicus in an erect posture; but, if in a reclining posture, the line that passes through the umbilicus will be at right angles to the diameter of the

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the brim: and, in general, whatever is said of the angle which the axis makes with the diameter, is to be understood of the diameter of the brim, when the woman is erect; and of the horizontal line when reclined. But, towards the end of pregnancy, a line to pass through the centre of the pelvis must fall half-way between the navel and scrobiculus cordis.

The axes of the different parts of the pelvis, formed by a diagonal, show the curved line of direction which the child's head describes in passing; and if these axes are supposed to be prolonged, they give the *déplacement* of the child's body.

THE female pelvis differs from the male chiefly in the following particulars: The angle which the vertebræ lumborum make with the sacrum is more obtuse, the ilia are more expanded, the concavity of the sacrum and coccyx is larger, the connection of the coccyx with the sacrum is looser, the tuberosities of the ischia are placed at a greater distance, the symphysis of the pubes is thicker, the arch of the pubes and the lateral openings are more considerable, and the pelvis is wider in all its dimensions.

## SECTION III.

*Distorted pelvis.*

THE figure and proportions of the pelvis vary in some degree in different women; for the depth and form may be so affected by different degrees of distortion, as not only greatly to diminish its cavity, and occasion less or more difficulty and danger in delivery, but in some instances to such a degree as to render the birth of a living child altogether impossible. As the proportions above described constitute what is called a *standard pelvis*, if it come short of these dimensions, the pelvis becomes faulty or diseased.

There are different kinds, as well as degrees, of narrow pelvis. Sometimes the cavity of the pelvis is constitutionally small, without any deformity. Sometimes there is a narrowness confined to the brim; sometimes to the inferior aperture. Sometimes the distortion is general over all the pelvis: And sometimes the capacity is retrenched by an intrusion of the *vertebræ lumborum* over the *sacrum*; which may be so considerable, as to reduce the diameter of the brim to the space only of two or three inches, or even less: and this is the species of distortion most frequently observed in practice. The *vertebrae* of the *sacrum* may be also, from pressure while in a morbid state,

state, so deformed and protruded, as to render that bone quite straight, and from the same cause often convex instead of concave.

The causes of narrow pelvices are chiefly ricketty affections in infancy, also external violence; such as fractures and dislocation of the bones, &c. The bones also become softened by disease in the adult state; and are then liable to narrowness and distortion, even in women who have formerly had easy labours\*; but such cases are rare. If the pelvis should not measure above two inches and a half from pubes to sacrum, and not above three laterally, it would be impossible to save the child at full growth, in any other manner than by enlarging the capacity of the pelvis by an incision of the symphysis pubes.

It is often extremely difficult to discover a narrow pelvis, especially if the narrowness be confined to the brim. We may suspect the distortion, from the make and shape of the woman. The direction in which the spine is distorted frequently determines it. But the pelvis is not always affected by a morbid curvature of the spine: if that extend, however, to the lumber vertebrae, the pelvis very seldom escapes: though the most certain and infallible diagnostic is the distortion of the inferior extremities along with a twisted spine. Women who are well proportioned in  
the

\* *Vide* Vol. V. of the London Medical Observations and Inquiries, case of Caes. Op. by Dr Cooper.

the lower extremities, have generally good pelvises. When these are ill proportioned or crooked, especially the thigh bones, along with other suspicious appearances, the pelvis is very generally, though not universally, deformed.

We can generally, by the touch, discover any species of distortion in the pelvis, below the brim, from the tuberosities of the ischia approaching too near each other, from the convexity of the sacrum, from the difference of shape in the arch of the pubes, &c.

When the deformity is at, or above, the brim, and the woman otherwise well shaped, it is often impossible to ascertain the narrowness till the labour be considerably advanced, and the child's head presenting in a conical form, with the bones protruding over one another, which are pretty certain marks of a narrow pelvis, or of a very large head.

But in order to understand the dimensions of the pelvis, it will be proper to consider the structure and form of the head of the foetus; which, being compounded of different pieces, is admirably well adapted for accommodating itself to the figure and diameters of the pelvis.

The figure of the head is spheroidal, being composed of two ovals a little depressed on each other; one of which is superior, called the *cranium*, the bones of which are smooth and uniform, with intervening

D

spaces,

spaces, called *futures*, that on pressure allow the bones to yield and slide on each other; whereas the bones of the face, which make the anterior oval, are more solid, rough, and uneven, and must therefore give considerable resistance in Passing through the pelvis.

Eight bones compose the *Cranium*, six of which are proper, *viz.* the *Os Frontis* and *Occiput*, two *Ossa Parietalia*, two *Ossa Temporum*, and two common to *Cranium* and face, the *Ethmoid* and *Sphenoid*. The bones are connected to each other by the *coronal lambdoïdal, sagittal, and squamous futures*.

The head is broader behind than before, and the face is broader above than below.

On the upper part of the cranium, where the sagittal and coronal futures cross each other, is a membranous space called the *fontanella* or *open of the head*.

The point from which the hair diverges is called the *vertex*.

The head, like the pelvis, has different diameters. The ordinary dimensions at birth are as follows:

From the *os frontis* to the *occiput*, between 4 and  $4\frac{1}{2}$  inches; or, according to Dr Burton,  $4\frac{3}{16}$  inches.

Laterally, from temple to temple, 3 inches.

Laterally, at the posterior part,  $3\frac{1}{2}$  inches.

From the top of the head to the nape of the neck,  $3\frac{6}{16}$  inches\*.

The

\* See Dr Burton's N. S of Midwifery, table 1. fig. 3. and 4.

The length of the face from the chin to the forehead, is about  $5\frac{1}{4}$  inches.

The length of the whole head from chin to vertex, about  $5\frac{1}{2}$  inches; and when the vertex is stretched out in laborious births, about 6 or 7 inches.

The total circumference of the head, between 12 and 14 inches, or somewhat more.

The breadth of the body at the shoulders, is about 5 or 6 inches.

The breadth of the body at the breech, about 5 inches.

The circumference of the body at shoulders and breech, from 15 to 18 inches.

The length of the whole body, 20 or 21 inches.

Considering the structure, form, and diameters of the pelvis and child's head, the application, in regard to the mechanical descent of the head through the pelvis, is sufficiently obvious; but, as the bulk and diameter of the one is not always mathematically adapted to the capacity of the other, difficulties must sometimes arise. Hence the advantage of this peculiar structure and mechanism of the *cranium*: for if the child's head were one firm ossified body, whose dimensions at any time exceeded those of the cylindrical cavity through which it should pass, however mechanically and with whatever force it descended, the delivery could not be accomplished without extraordinary

traordinary assistance; and the consequences would always prove fatal either to mother or child.

The shoulders are also capable of considerable diminution by pressure; and the separation of the ossa innominata in the foetus may contribute, somewhat, to facilitate the passage in birth. For living children are often brought into the world without artificial assistance, the bulk of whose bodies considerably exceeds the largest diameter of the pelvis.

## SECTION IV.

### *General Observations.*

1. **T**HOUGH the cartilaginous symphyses at the anterior and posterior parts may be, in some degree, relaxed in time of labour, it appears sufficiently obvious, from a superficial view of the structure and articulation, that the bones are incapable of separation sufficient to enlarge, in any sensible extent, the capacity of the pelvis, but in consequence of disease, or from violence. In that state the bones may be forced by the throes of labour; but the woman becomes lame, and generally continues so for life.

2. Such a separation may, however, be procured by incision at the symphysis pubis, in general, though not always with safety to the mother; and a child, which would otherwise infallibly be destroyed; may  
by

by that means be extracted alive. The success of this operation, since first performed by *Monf. Sigault*, is not yet sufficiently established to enable us to speak of it in a decisive manner, nor to point out the particular circumstances in which it may be attempted with propriety. But we may here observe, that it cannot, in cases of difficulty and danger, be performed with an absolute certainty of preserving either the mother or child, from the difficulty of ascertaining the real dimensions of the pelvis, and of the increased space to be gained by the operation.

3. The shape and construction of the child's head, which admits of considerable diminution by pressure, sufficiently compensate for the want of motion of the bones of the pelvis: for the head is of an oval or spheroidal figure, and the membranous futures permit a free play of the cranial bones by the force of labour. But in different subjects it varies in shape, structure, and solidity. Hence, in passing through the capacity of the pelvis, it will not always be commodiously modelled to suffer that diminution of its bulk, from pressure, which may be necessary. If, therefore, the volume of the child's head be disproportioned to the diameters of the brim or outlet of the pelvis, or if the long axis of the one be applied in an improper direction to the other difficulties will occur that will require extraordinary assistance.

4. It is therefore of the utmost consequence to know the figure, structure, mode of position of the

child's head, and the shape and proportions of the different openings of the pelvis; and to remember, that these proportions are reversed in the ovals of the posterior and inferior apertures; that the depth of the superior part is to the anterior as three to one, and to the sides as three to two.

5. These proportions are, however, liable to considerable variation in different subjects; and the whole pelvis may become so affected, as to have its brim, depth and inferior aperture, considerably retrenched and diminished, either from an original mal-conformation, from bruises, postures, &c. or from disease.

6. Those women who appear, from some distortions, to have been subject to rickets, have probably a contracted pelvis; and the probability is greatly strengthened if the lower extremities have suffered.

7. Deformities of the spine from the other causes do not generally influence the pelvis; so that every woman apparently crooked, has not always a laborious and difficult birth.

8. All the different distortions of the pelvis may be accounted for from the pressure of the body on the bones previously softened by disease, *viz.* by the pressure of the upper parts on the spine, and by that of the whole body on the ossa ischia and pubis.

## C H A P. II.

## FEMALE PARTS of GENERATION.

THE organs of generation, so called from their use in propagating and increasing the species, are divided into *external* and *internal*.

The external parts are, the *mons veneris*, the *labia externa*, the *labia interna alæ minores* or *nymphæ*, the *clitoris* with its glans and *præputium*, the orifice of the *urethra*, the *os externum*, membranous expansion called *hymen*, *carunculæ myrtiformes*, *sphincter vaginae*, and glands of the parts.

The internal parts are, the *vagina*; the *uterus*, with the ligaments, *ovaria*, and Fallopian tubes; and the blood-vessels and nerves of the parts.

The contiguous parts are, externally, the *anus*, *sphincter ani*, and *perinæum*; internally, the bladder, *urethra* and *rectum*.

The *mons veneris* is nothing more than the skin raised by a quantity of adipose substance collected under it, that cushions it up externally in the form of a tumor. From the lower part of which the great *labia* begin, and run downwards, till they are bounded by the *perinaeum*, or by what the French call *fourchette*. In their structure they are cellular, but more ligamentous than the *mons veneris*. Their inner surface is villous and glandular, separating a sebacious

sebacious kind of liquor analogous to that about the corona glandis of the male.

Upon separating the labia externa, a red projecting body appears, called *clitoris*, composed of two crura, which arise from the lower part of the ossa pubis, approach one another, and form the body of the clitoris, whose extremity is its *glans*, covered with a loose doubling of the skin, called *præputium*.

The *nymphæ* are placed immediately within the external labia, and are continued downwards and forwards on the anterior symphysis pubis nearly as far as the orifice of the urethra. They are productions or folds of the integuments resembling fraena, and very vascular. When the labia externa are open, they will devaricate; and when shut, come into contact.

Downwards from between the nymphæ runs a smooth *fossa*; at the bottom of which is a prominence, in the centre of which is the *orifice* of the *urethra*. Its usual situation is nearly opposite to the inferior extremities of the nymphæ.

Below the urethra is the aperture into the vagina, called *os externum*; which has round its orifice the *carunculæ myrtiformes*, supposed to be the remains of the ruptured hymen (a membrane peculiar to infancy, that surrounds the entry of the vagina in form of a crescent): but many anatomists deny that these carunculæ are formed from the lacerated hymen, and maintain that they exist previous to its rupture.

The

The *sphincter vaginae* is a flat muscle, coming out insensibly from the perinaeum, and is lost chiefly in the crura clitoridis. In very muscular subjects, its fibres run quite round the vagina. There is a plexus of nerves and blood-vessels, called *plexus reteformis*, that goes up on the inside of this muscle, and communicates with the clitoris; which, of consequence, will be compressed between it and the penis in coition.

The *glands* of these parts are situated in such a manner, that, upon pressure, a considerable quantity of viscus humour is thrown out in time of coition; so that by many this liquor was thought to be the *semen fæmineum*.

The structure of these parts renders them all calculated for nearly the same purpose, *viz.* to give titillation *in coitu*. The clitoris is situated in the part where it is most exposed to friction by the introduced penis: its use, therefore, chiefly, is to render the sensation *in coitu* more exquisite. These parts, in proportion to their sensibility, are exceedingly irritable, and subject to considerable inflammation and tumefaction even in the easiest labours. Hence the impropriety and hazard of *officious touching* in the beginning of labours, while the presenting part of the child is at a distance, while the passage is narrow and tight, and not yet sufficiently relaxed by the lubricating mucus which is afterwards so plentifully  
thrown

thrown out for the purpose. The orifices of these parts, observing the direction of the sacrum and perinaeum, do not run straight out, but downwards and forwards; by which the vagina, uterus, and rectum, are in less danger of protrusion. In the introduction of the catheter, the point should therefore be directed, first a little downwards and backwards, then gently raised forwards and upwards rather than quite straight.

The *vagina*, or passage to the womb, lies immediately under the bladder, and upon the rectum. It is commonly in length about four or five inches: but this differs in different subjects, and at different ages: as also its diameter, which is narrow and contracted in young women, but capable of very considerable dilation; for in virgins it is full of rugae, but smoother in married women and those who ~~who~~ have born children. It is composed of a plexus of muscular fibres, and a rugous membrane; and its structure is also nervous and glandular. Its internal coat is continued upwards, and makes the inner covering of the uterus.

The vagina and body of the uterus are connected with the bladder, a good deal higher up than with the rectum.

The vagina leads to the os uteri, which projects a little into that cavity, and advances rather more forward in the lower posterior than in the upper anterior part.

The

The *uterus* lies in the middle of the pelvis, loosely between the rectum and bladder; but its position is liable to variation at different periods of life, and is affected by various other circumstances. It is triangular, of the figure of a pear or small powder-flask, and generally about three inches long, somewhat convex on its superior part and, by pressure, a little flattened below.

It is divided into its *cervix* or *collum*, and *fundus*. On being cut open, it appears of a compact solid substance, broader at its upper part, and narrower at the neck: its cavity is very inconsiderable in the unimpregnated state, for the sides of the plane almost come in contact. Though its structure is muscular, its muscular fibres can with difficulty be traced: They appear to be mostly circular; but are very difficult to unravel. Its vessels proceed from the spermatics and hypogastrics. The arteries are very small in proportion to the veins; which, in time of the gestation, are so much dilated, as to have obtained the name of *sinuses*. Its nerves come from very small filaments: and are chiefly furnished from the intercostals, those of the sacrum, and the sympathetic *maximi*. It is also supplied with lymphatic vessels.

The uterine *ligaments* are of two kinds; the *ligamenta lata* and the *ligamenta rotunda*. The former are no more than part of the peritonaeum, which, after giving a coat to the uterus, goes out laterally to form these ligaments and are therefore only doublings of that

that membrane, like the mesentery to the intestine. Through these doublings the vessels of the uterus run. they have two folds in their upper part : The anterior contains the Fallopian tubes ; the posterior, the ovaria.

Each of the ligamenta rotunda is a little plexus of muscular fibres, nerves, and vessels, enveloped in a common membrane, in the form of a cord or ligament, coming down before the Fallopian tubes, and going out at the rings of the abdominal muscles to be lost in the groin.

In the anterior plica of the broad ligaments the *Tubæ Fallopiantæ* are contained. They have one extremity fixed to the fundus uteri, where the perforation is so small it will hardly admit of a hog's bristle ; but the diameter gradually enlarges, becoming wider and wider like a trumpet, till it terminates in a loose floating extremity called *Morsus Diaboli*. This cavity is not straight, but convoluted : When inflated, it seems to be strung upon the broad ligament, as the the intestines are upon the mesentery.

The *ovaria* are two flattened oblong bodies, not very unlike the male testes, situated at the sides of the uterus, on the posterior part of the ligamenta lata. Their shape and size are different in different women : Their outer surface is divided by a number of chops but is smoother and more uniform in virgins than in married women who have had children. There is little to be observed in their texture, except a number  
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of vessels, and something like vesiculæ or water-bags ; these were supposed to be the ova, remarkable in the ovaria of quadrupeds. When a woman dies with child, one particular cavity is observed, which was thought to be the calyx from whence the ovum had dropped, and is called *corpus luteum* : but later physiologists think that these corpora lutea are glands, containing the female semen, which in the time of coition burst and throw out their contents into the tube in form of a liquid ; which, when mixed or blended with the seminal fluid of the male, is supposed to be conveyed through the tube into the uterus, to become the rudiments of the future foetus. Most of the phenomena of impregnation correspond with this theory. Foetuses have been found in the cavity of the abdomen, where there has been no rupture of the uterus ; and bones have made their way through the belly, while the uterus has been found perfectly sound.

Contiguous to the genital parts are, externally, the *anus* and *perinæum* ; internally, the *rectum*, *urethra*, and *bladder* of urine.

The *anus* is the orifice of the *rectum*, which is the centre of axis of the pelvis. It is contracted into rugae by a plexus of muscular fibres called *sphincter ani*, which answers nearly the same purpose as it does in the male, and is lost in the *perinaeum*, instead of the bulb of the *urethra*.

The *rectum* runs in a line, not quite straight, behind the vagina and uterus, in the hollow part of the sacrum, through the capacity of the pelvis, and is supported upon the coccyx and muscles below, as in the male.

The *urethra* is about an inch and a half long; has no regular prostate, like the male; but is supplied with a number of small glandular bodies, placed along the whole interior surface.

The *bladder* is situated over the vagina and uterus immediately behind the pubes: and is supposed to be larger and more capacious than in the other sex.

As the vagina and urethra lie between the rectum and bladder, any disorders in the one will readily bring the other into sympathy.

The *perinæum* is the septum or space between the os externum vaginae and the anus. It is chiefly made up of the sphincter ani and vaginae muscles, the common integuments, and cellular substance. In its natural state it does not much exceed an inch in length, but is considerably stretched in time of labour.

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## C H A P. III.

### Of the M E N S E S.

**B**EFORE we proceed to treat of the different theories of Conception and Generation, it will be necessary to consider a particular phenomenon, that begins,

begins to appear in women about the age of puberty, viz. the menstrual flux.

At the age of 13 or 14 years, and nearly at the same time that the semen begins to form itself in the male, a considerable change happens to the female: for at this time the blood begins to circulate with an increased force: the pubes begins to be covered with hair, the breasts to swell, and the menfes to make their appearance. The vessels of the womb, which in the foetus transfused a thin whitish liquor, and in the young girl a sort of serum, begin now to swell with blood, and to disposite some of it in the cavity of the uterus. They continue so to do for some days, commonly three, four, or five; when the uterine vessels gradually contract themselves, and only allow a little serous moisture to pass as before, till again, at the end of three or four weeks, they open and discharge a like quantity of blood. This evacuation continues to return periodically, till about the 45th year, though with some it continues longer, and with others it stops soon after the 40th, or between this and the 50th year.

This discharge from the uterus does not flow in a stream, but gently drills for three, four, or five days; though most commonly for three only. The quantity generally evacuated is between 5 and 10 ounces.

The periodical returns are not the same in all women; which variety chiefly depends on constitution,

manner

manner of life, and climate. But such an evacuation, at nearer or more distant periods, seems essentially necessary both for health and generation. Where it is either deficient or irregular, bad health is generally the consequence; and women who have passed the age of puberty, for several years, without any appearance of the menstrual discharge, very generally prove barren.

The cause of this periodical evacuation, peculiar to the females of the human species, has been a curious and perplexing subject of inquiry in all ages.

In the infancy of medicine, when fancy more than judgment influenced the theory, it is not surprising that the most chimerical reasons should have been given, to account for an appearance so striking and so important. Thus it was attributed to the influence of the moon, from its periodical appearance; to a ferment in the fluids, when fermentation was introduced to account for every phenomenon. Men, in other views respectable, have exerted all their ingenuity in defence of these theories; but they are now exploded, and the catamenia are supposed to arise from an universal plethora, or a topical congestion: these opinions we shall proceed to examine.

From a superficial view of the several phenomena, it would appear probable that the menses are occasioned by plethora. But this idea of itself is vague, and will not account for all the appearances. By plethora we understand, a larger quantity of blood than

than is adapted to the capacity of the vessels, either of the whole system, or of any particular part. This may depend on the increase of the absolute quantity of the fluids; or on a constriction of the vessels. It is the former of these that seems to be meant by the advocates for a general plethora; and the chief arguments seem to be derived from the debility, inactivity, and swelling of the breasts. The two former, though often depending on plethora, may be produced by many other causes; so that no argument can be drawn for them. The last by no means shows an increased quantity of the fluids in general; it seems much connected with the state of the uterus, and takes place in states of the system very disadvantageous for a general fulness. We may, with some confidence, therefore, reject an opinion that has many direct arguments against it. For many of the symptoms are not to be explained by plethora, or by any other supposition.

A late and probable opinion is, "that the MENSES depend on a TOPICAL CONGESTION." This opinion has been for some time delivered at this university by the ingenious Dr CULLEN; and is supported, not only by the most plausible arguments, but by its consistency with many other appearances in the human body. We shall content ourselves with giving a short view of it, which may enable those to form some judgment who have not had an opportunity of hearing it from himself.

He observes, "that the growth of the body de-

pends upon the increase of the quantity of fluids giving occasion to the distention of the vessels, and thus producing the gradual evolution and full growth of the whole system. This evolution does not happen equally in every part of the body at the same time, but successively according to the different size and density of the several vessels determined by the original stamina. Thus the upper parts of the body first acquire their natural size, and then the lower extremities. By the same constitution it seems to be determined, that the uterus of the human species should not be considerably evolved, till the rest of the body is nearly arrived at its full bulk. But as the vessels of every part, by their distention and growth, increase in density, and give thereby more resistance to their further growth, at the same time, by the same resistance, they determine the blood in greater quantity into the parts not yet equally evolved. By this means the whole of the system must be successively evolved, till every part is brought to that degree of distention which is necessary to bring them to a balance in respect of density and resistance with one another. Upon these principles, there will be a period in the growth of the body, when the vessels of the uterus will be distended till they are in balance with the rest of the system; and their constitution may be such, that their distention may proceed so far as to open their extremities, terminating in the cavity of the uterus, so as to pour out blood there; or it  
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may happen, that a certain degree of distention may be sufficient to irritate and increase the action of the vessels, and thereby to produce an hæmorrhagic effort, which may force the extremities of the vessels, with the same effect of pouring out blood.

“ In either way, he accounts for the first appearance of a flow of blood from the uterus in women. In order to this, he does not suppose any more of a general plethora in the system, than what is constantly necessary to the successive evolution of the several parts of it; and he proceeds upon the supposition, that the evolution of each particular part must especially depend upon the plethora, or increased congestion, in its proper vessels. Thus he supposes it to happen with respect to the uterus; but as its plethoric state, he observes, produces an evacuation of blood from its vessels, this evacuation must empty these vessels more especially, and put them again into a relaxed state with respect to the rest of the system. This emptied and relaxed state of the vessels of the uterus will give occasion to a new congestion of blood in them, till they are again brought to that degree of distention that may either force their extremities, or produce a new hæmorrhagic effort, that may have the same effect. Thus an evacuation of blood from the uterus, being once begun by the causes before mentioned, it must, by the operation of the same causes, return after a certain period, and must continue to do so till particular circumstances occasion a considerable

considerable change in the constitution of the uterus. What determines the periods of these returns to be nearly in the space of a month, he cannot exactly explain; but supposes it to depend upon a certain balance between the vessels of the uterus and those of the other parts of the body. This must determine the first periods; and when it does so, it can be understood, that a considerable increase or diminution of the quantity of blood in the whole system will have but little effect in increasing or diminishing the quantity distributed to the uterus. It may also be further observed, that when the evacuation has been repeated for some time at regular periods, it may be supposed that the *power of habit*, which so readily takes place in the animal system, may have a great share in determining the periodical motions of the uterus to be with great regularity, tho' in the mean time considerable changes may have happened with respect to the whole system."

This theory, though still liable to objections, seems, however, as rational as any opinion that has yet been advanced: nor shall we ever perhaps be able clearly to investigate the secret principles upon which this, and many other phenomena of the animal œconomy, equally intricate and mysterious, depend.

## C H A P. IV.

*Of the Gravid UTERUS.*

**T**HIS subject comprehends the theory of conception; the structure and increase of the ovum in early gestation; the evolutions of the germ in its different states of embryo and foetus; the contents of the gravid uterus in advanced gestation, and changes which the uterine system suffers during the progress; the mode of circulation between the mother and foetus, and within the body of the foetus, its peculiarities, &c.; and some subjects connected with gestation, as extra-uterine conception, superfœtation, and the generation of monsters.

## S E C T I O N I.

*Of Conception.*

**T**HE theory of conception is as intricate and obscure as the cause of the periodical evacuation of the catamenia; and many circumstances relating to generation will, perhaps, ever remain a mystery. The different hypotheses suggested on the subject may, however, be referred to the following.

I. To those who think that the rudiments of the foetus are contained in the mother.

II. To those who are of opinion that they exist in the male.

III. To

III. To those who imagine the foetus results from an union of both.

That each of these systems has had its several supporters and antagonists, will not be surprizing, when we consider the obscurity of the subject, as well as the extent of learning and brilliancy of imagination which have distinguished the several combatants. HARVEY, our illustrious countryman, belongs to the first class; the acute LEEUWENHOEK, who perceived living animals, or bodies which resembled them, in the semen masculinum, has added lustre to the second; and the Count de BUFFON, whose ingenuity and acuteness are distinguishable even in an enlightened nation, is the chief supporter of the third opinion.

We shall consider, at some length, their several systems in another place; it is enough, at present, to observe, that the pride of science, and brilliancy of imagination, have been equally unsuccessful. To elude difficulties which they cannot conquer, modern philosophers have endeavoured to transfer the question; and by supposing the animal already to exist complete in its several parts, but of an astonishing minuteness, have rather laboured to show by what means it is animated, and by what assistances evolved.

This view, when extended to successive generations, at first startles the modest inquirer by its apparent absurdity, and perplexes the moderate calculator.

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tor. It, however, is not more contradictory than many physiological positions which have never been controverted; and it is some addition to its credit, that it is supported by BONNET and HALLER. On this foundation, which is supported also by the authority of HARVEY, the *principle of animation* must be the *semen masculinum*; and it is not entirely without reason, that BONNET considers it as the first and chief support of the foetus: but an extensive period is required to evolve the several very intricate organs of which the human frame consists.—The embryo is, at first, almost entirely vegetative: it adheres to the fundus uteri, and extracts the fluids of its mother without any exertions that are peculiarly its own. But it soon shows some marks of animation. Its heart is observed to beat: it seems to prepare fluids for its own purposes, and to separate those which are no longer beneficial: in short, it acquires a distinct system; from part of which it is supplied with the original portion of its fluids; and which it, in its turn supplies with the same fluids more highly elaborated, and more carefully prepared. But this rather belongs to the history of the ovum, which we shall next consider.

## SECTION II.

*Structure of the Ovum in early Gestation.*

WHEN the germ is conveyed into the uterus, *impregnation* is said to take place. The ovum, soon after its introduction, adheres to some part of the internal surface of the uterus: at first it appears like a small vesicle, slightly attached; and gradually increases in bulk, till it apparently comes in contact with the whole cavity of the fundus.

The embryo, or unformed foetus, with placenta, umbilical cord, membranes, and waters, in early gestation, constitute the ovum; which then appears like a thickened fleshy mass, the more external lamellae and other parts, which are afterwards separate and distinct, being blended and jumbled in such a manner that they cannot be readily distinguished or traced.

In the progress of gestation, the external lamella, or membranous surface, by stretching, grows thinner; the cavity which contains the rudiments of the foetus becomes more apparent; and then a thick vascular part on the outside of the chorion called *placenta*, can be readily distinguished from the membranous portion of the ovum.

The external membranous part of the ovum (or bag which contains in its cavity the embryo, funis, and watery fluid in which the embryo floats) is originally

nally composed of three coats : the internal lamella, or that next the foetus, is called *amnios* ; the next is the *true chorion* ; and the external is called the *false* or *spongy chorion*. But it is supposed to derive an extraordinary lamella immediately from the uterus, which constitutes the external covering of the ovum. This production, which is supposed to be entirely formed by a continuation of the internal membrane of the uterus, is at first loosely spread over the ovum, and afterwards comes in contact with the false chorion. These two lamellae, which form the external vascular surface of the ovum, are much thicker than the internal membranes of the true chorion and amnios ; and the proportion which they bear to the other parts is so great, that, in early conception the mass of the ovum is chiefly composed of them. Dr Ruysch called this exterior coat the *tunica filamentosa* ; more modern authors, the *false* or *spongy chorion*. But Dr Hunter has found the spongy chorion to consist of two distinct layers : that which lines the uterus he styles *membrana caduca* or *decidua*, because it is cast off after delivery : the portion which covers the ovum, *decidua reflexa*, because it is reflected from the uterus upon the ovum, forming the connecting medium between them. The portion which covers the ovum is a complete membrane, like the true chorion and amnios : but that which immediately lines the uterus is imperfect or deficient, being perforated with three

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foramina,

foramina, viz. two small ones, corresponding with the insertion of the tubes at the fundus uteri; and a larger ragged perforation opposite to the orificium uteri\*.

Thus, according to Dr Hunter, the embryo, on its first formation in the ovum, and the foetus during the whole time of gestation, is inclosed in four membranes, viz. the double, false or spongy chorion, called *membrana decidua*, and *decidua reflexa*; the true chorion, and the amnios, which include a fluid called the *liquor amnii*, in which the embryo floats.

The true chorion and the amnios are decidedly organized membranes, containing vessels, and composed of regular layers of fibres. The decidua, and decidua reflexa, differ in appearance, and seem to resemble those inorganic substances which connect inflamed viscera. If they be original membranes, and only visible from their evolution and increase, it is not easy to conceive how the ovum gets behind them, since the Fallopian tubes are not covered by them. We are therefore inclined to adopt an opinion suggested first by Mr Falconer and Mr Crookshanks, and rendered probable by the experiments of Signor Scarpa, "That they are entirely composed of an inspissated coagulable lymph," in a manner that we shall have occasion to explain.

Between the amnion and chorion a quantity of gelatinous fluid is contained in the early months; and a

small

\* See Dr Hunter's Tables, Pl. xxxiv. fig. 5. & 6.

small bag, or white speck, is then observed on the amnion, near the insertion of the umbilical cord. It is filled with a white liquor, of a thick milky consistence; and is called *vesicula umbilicalis*, *vesicula alba* or *lactea*: it communicates with the umbilical cord by a small funis, which is made up of an artery and vein. This vesicle, and duct or tube leading from it, are only conspicuous in the early months; and afterwards become transparent, and of consequence invisible\*. Their use is not yet understood.

Though the bag, or external parts of the conception, at first form a large proportion of the ovum in comparison of the embryo or foetus, in advanced gestation the proportions are reversed. An ovum between the eighth and ninth week after conception, is nearly about the size of a hen's egg, while the embryo scarcely exceeds the weight of a scruple: at three months, the former increases beyond the magnitude of a goose's egg, the weight above eight ounces; but the foetus does not then amount to three ounces: at six months, the foetus weighs twelve or thirteen ounces, and the placenta and membranes only seven or eight: at eight months, the foetus generally weighs somewhat more than five pounds, the secundines little more than one pound: at birth, the foetus weighs from six or seven to nine pounds, which

\* Vide Dr Hunter's elegant Plates of the Gravid Uterus, Pl. xxiv. fig. 2.

which it rarely exceeds\*; but the placenta seldom increases much in bulk from between the seventh and eighth month.

Having described the ovum in early gestation, we shall next take a view of the germ; trace the progress of the embryo and foetus; then resume the subject of the ovum, to explain the structure of the membranes, placenta, &c. in advanced gestation, and point out the most remarkable changes which the uterus suffers during impregnation.

### SECTION III.

#### *Evolution of the Foetus.*

**T**HERE can be little doubt that all the parts of an animal exist completely in the germ, though their extreme minuteness and fluidity for some time conceal them from our sight. In a state of progression, some of them are much earlier conspicuous than others.

The embryo, in its original state, is probably entirely fibrous and nervous; and these primary parts seem to contain, in a small scale, all the others which are afterwards to be progressively evolved. Of the former the heart and liver, of the latter the brain and spinal

\* *Natura sibi semper constans manet, consuetum maturorum foetuum pondus esse inter 6 et 7 libras civiles medium; rarius 9 libras excedere.*—Henr. Aug. Wrisbergii *Obs. Anatomicae, &c.* Goettingæ, 1779.

spinal medulla, first become conspicuous: for the spine or carina of the embryo is formed some time before any vestige of extremities begin to sprout. The encephalon, or head, and its appendages, first appear; then the thoracic viscera; next, the abdominal: at length the extremities gradually shoot out; the superior first, then the inferior: and, by slow and insensible gradation, the beautiful and admirable structure of the whole complicated system is evolved.

As soon as the embryo has acquired sufficient consistence to be the subject of any observation, a little moving point, which is the heart, discovers itself. Nothing, however, but general circumstances relating to the particular order and progress of the successive germination or evolution of the viscera, extremities, vascular system, and other parts of the human fœtus, can be ascertained, as it is beyond the power of anatomical investigation.

It is also exceedingly difficult to determine the age or proportional growth of the fœtus. The judgment we form will be liable to considerable variation: 1st, From the uncertainty of fixing the period of pregnancy; 2dly, From the difference of a fœtus of the same age in different women, and in the same woman in different pregnancies; and, lastly, Because the fœtus is often retained *in utero* for some time after the extinction of its life.

The progress of the foetus appears to be much quicker in the early than latter months: but the proportional increase is attended with difficulty in the calculation; for this, among other reasons, that we have not an opportunity of knowing the magnitude or weight of the same foetus in different months. It will also, probably, be materially influenced by the health, constitution, and mode of life, of the parent.

A foetus of four weeks, is near the size of a common fly; it is soft, macilaginous, seems to hang by its belly, and its bowels are only covered by a transparent membrane. At six weeks, the consistence is still gelatinous, the size about that of a small bee, the head larger than the rest of the body, and the extremities then begin to shoot out. At twelve weeks, it is near 3 inches long, and its formation pretty distinct\*. At four months, the foetus measures above 5 inches; at five months, between 6 and 7 inches; at six months, the foetus is perfect in all its external parts, and commonly in length about 8, or between 8 and 9 inches; at seven months, it is between 11 and 12 inches; at eight months, about 14 or 15 inches; and at full time, from 18 to 22 or 23 inches. But these calculations, for the above reasons, must be very uncertain.

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\* *Vide* Dr Hunter's elegant Plates of the Gravid Uterus, the Works of Dr Harvey, De Graaf, Malpighi, Haller, &c.

## SECTION IV,

*Contents of the Gravid Uterus in advanced Gestation.*

**T**HESE consist of the Fœtus, Umbilical Cord, Placenta, Membranes, and Contained Fluid. We have already traced the progress of the fœtus; and shall proceed to describe the other parts of the ovum in advanced gestation, as just now enumerated.

## UMBILICAL CORD.

The fœtus is connected to the placenta by the umbilical cord, or navel-string; which may be defined, “a long vascular rope, composed of two arteries and a vein, covered with coats derived from the membranes, and distended with a quantity of viscid gelatinous substance to which the bulk of the cord is chiefly owing.”

The cord always arises from the centre of the child's belly, but its point of insertion in the cake is variable. Its shape is seldom quite cylindrical; and its vessels are sometimes twisted or coiled, sometimes formed into longitudinal sulci. Its diameter is commonly about the thickness of an ordinary finger, and its length sufficient to admit the birth of the child with safety, though the placenta should adhere at the fundus uteri. In length and thickness, however, it is liable to considerable variation. The extremity

next

next the foetus is generally strongest; and is somewhat weaker and more slender next the placenta, according to its place of insertion; which, though commonly not far from the centre, is sometimes towards the very edge. This suggests an important advice to practitioners, to be cautious of pulling the rope to extract the placenta when they feel the sensation of its splitting as it were into two divisions, which will proportionally weaken its resistance, and render it liable to be ruptured with a very slight degree of force in pulling.—The use of the cord is to connect the foetus to the cake, to convey the nutritious fluid from the mother to the child, and to return what is not employed.

#### PLACENTA.

THE Placenta, Cake, or After-birth, is a thick, soft, vascular mass, connected to the foetus by the funis umbilicalis, and to the uterus by means of the spongy chorion, as already explained. It differs in shape and size, it is thickest at the centre, and gradually becomes thinner towards the edges, where the membranes go off all round, making a complete bag or involucre to surround the waters, funis, and child.

Its substance is chiefly vascular, and probably in some degree glandular. The ramifications of the vessels are very minute, which are unravelled by maceration, and, when injected, exhibit a most beautiful

ful appearance resembling the bushy tops of a tree. It has an external convex, and an internal concave, surface. The former is divided into a number of small lobes and fissures, by means of which its adhesion to the uterus is more firmly secured. This lobulated appearance is most remarkable when the cake has been rashly separated from the uterus; for the *membrana decidua*, or connecting membrane between it and the uterus, being then torn, the most violent and alarming haemorrhagies frequently ensue.

The internal concave surface of the placenta is loosely covered with the amnion, and by the chorion more immediately and intimately. From this internal surface arise innumerable ramifications of veins and arteries, which inosculate and anastomose with one another; and at last the different branches unite, and form the *funis umbilicalis*.

The after-birth adheres to every part of the internal surface of the uterus, as at the posterior and anterior superior parts, laterally; and sometimes, though more rarely, part of the cake extends over the *orificium uteri*; from whence, when the orifice begins to dilate, the most frightful and dangerous floodings arise. But the most common place of attachment of the cake is from the superior part of the cervix to the fundus.

Twins, triplets, &c. have their placenta sometimes separate and sometimes adhering together. When  
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the placentae adhere, they have generally the chorion in common; but each foetus has its distinct amnion. They are commonly joined together, either by an intervening membrane, or by the surfaces being contiguous to one another: and sometimes the vessels of the one cake anastomose with those of the other.

The human placenta, according to Dr Hunter, is similar in structure to that of quadrupeds: and seems to be composed of two distinct systems of parts, a spongy or cellular, and a vascular substance. It has of consequence two distinct sets of vessels. The spongy or cellular part, formed by the decidua, is derived from the mother; and, if filled with injection, will increase the placenta to nearly twice its ordinary thickness; the more internal vascular part belongs entirely to the foetus, and can only be injected from the cord, as the spongy part by the filling the vessels of the uterus. This will be better understood when the mode of circulation between the parent and child is explained.

#### MEMBRANES.

THESE consist, externally, of two layers of the spongy chorion, called *decidua* and *decidua reflexa*; internally, of the true chorion and the amnion. They form a pretty strong bag, commencing at the edge of the cake, going round the whole circumference, and lining the internal surface of the womb. When separated from the uterus, this membranous bag is slender

slender and yielding, and its texture readily destroyed by the impulse of the contained fluid, the pressure of the child, or of the finger in touching; but in its natural state, while it lines the womb, and is in close contact with its surface, the membranous bag is so tough and strong as to give a considerable degree of resistance. It is also strengthened in proportion to the different layers of which it is composed, whose structure we shall proceed to explain more particularly.

1. The *Membrana Decidua*, or that lamella of the spongy false chorion which is in immediate contact with the uterus, is originally very thick and spongy, and exceedingly vascular, particularly where it approaches the placenta. At first it is loosely, as it were, spread over the ovum; and the intervening space is filled with a quantity of gelatinous substance. It gradually becomes more and more attenuated by stretching, and approaches nearer to the interior lamella of the decidua, called *decidua reflexa*; and about the fifth month the two layers come in contact, and adhere so as to become apparently one membrane\*.

2. *Decidua Reflexa*. In its structure and appearance it is similar to the former, being rough, fleecy, and vascular, on its external surface; internally, smoother, and perforated with a number of small foramina

\* Vide Dr. Hunter's Tables, Pl. xxvii. fig. 2. Pl. xxix. fig. 1. 2. 4. 5. Pl. xxxi. fig. 1. 2, &c.

foramina, which are the orifices of vessels that open into this internal surface. In advanced gestation, it adheres intimately to the former membrane, and is with difficulty separated when the double decidua comes off entire; but the outer lamella more commonly adheres to the uterus after the placenta and other membranes are expelled, and is afterwards cast off with the cleansings.

The decidua reflexa becomes thicker and more vascular as it approaches the placenta, and is then blended with its substance, constituting the cellular or *maternal* part of the cake, as it is termed by Dr Hunter. The other or more internal part belongs to the foetus, and is styled the *foetal* part of the placenta.

The *double decidua* is opaque in comparison of the other membranes; the blood-vessels are derived from the uterus, and can be readily traced into it. Dr Hunter supposes that the double decidua lines the uterus nearly in the same manner as the peritonæum does the cavity of the abdomen, and that the ovum is inclosed within its duplicature as within a double nightcap. On this supposition the ovum must be placed on the outside of this membrane, which is not very readily to be comprehended; unless we adopt Signor Scarpa's opinion already mentioned, and suppose it to be originally entirely composed of "an inspissated coagulable lymph."

3. The *true Chorion*, or that connected with the  
amnion,

amnio; is the firmest, smoothest, and most transparent of all the membranes, except the amnios; and, when separated from it, has a considerable degree of transparency. It adheres pretty closely to the internal surface of the cake, which it covers immediately under the amnios, and gives also a coat to the umbilical cord. It is connected to the amnio by means of a gelatinous substance, and is easily separated from it.

4. The *Amnio*, or internal membrane, forms the external coat of the umbilical cord. This internal lamella of the membranous bag is by much the most thin, attenuated, and transparent of the whole; and its vessels are so delicate, that they can hardly be discovered; their diameters are so small, as to be incapable in their natural state of admitting globules of red blood. It is, however, firmer and stronger than the chorion, and gives the greatest resistance in the breaking of the membranes.

The small bag, called *vesicula umbilicalis*, formerly described, and only conspicuous in the early months from its situation, is placed between the amnio and chorion, near the attachment of the cord; and, from the colour of its contents, has been mistaken for the urachus: but there is no allantois in the human subject.

The *allantois* in quadrupeds is an oblong membranous sac, or pouch, placed between the chorion

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and amnion. This membrane communicates with the urachus, which in brutes is open, and transmits the urine from the bladder to the allantois.

5. The *Waters* are contained within the amnion, and are called the *liquor amnii*. They are purest, clearest, and most limpid in the first months; acquiring a colour and somewhat rosy, towards the latter end. They vary in different subjects, both in regard to consistence and quantity; and, after a certain period, they proportionally diminish as the woman advances in her pregnancy. This liquor does not, in any respect, resemble the white of an egg; it is generally saltish, and therefore unfit for the nutrition of the child; some of it may perhaps be absorbed by the foetus, but the child is chiefly nourished by the navel-string. In the early months, the organs are not fit for swallowing; and monsters are sometimes born alive, where such organs are altogether wanting.

Water is sometimes collected between the chorion and amnion, or between the lamellae of the chorion. This is called the *false water*: It is generally in much smaller quantity than the true water; and, without detriment to the woman, may flow at any time of pregnancy.

HAVING described the contents of the gravid uterus, let us consider the changes which that organ suffers during the progress of gestation, and explain the manner of circulation between the parent and foetus,  
and

and within the body of the foetus : we shall then enumerate the most remarkable peculiarities of the *non-natus* ; and conclude the subject with a few observations on Superfoetation, extra-uterine Conception, and the Generation of monsters.

## SECTION V.

*Changes of the Uterine System from Impregnation.*

**T**HOUGH the uterus gradually encreases in size from the moment of conception till full time, and although its distention is proportioned to that of the ovum, with regard to its contents, it is strictly speaking, never completely distended : for, in early gestation, they are entirely confined to the fundus ; and, at full time, the finger can be passed for some way within the orificium uteri without touching any part of the membranes\*. Again, though the capacity of the uterus increases, yet it is not mechanically stretched, for the thickness of its sides does not diminish. The increased size seems, therefore, to depend on a proportional quantity of fluids sent to that part, nearly in the same way the skin of a child, though it suffers so great distention, does not become thinner, but preserves its usual thickness.

\* See Dr Hunter's Tables, Pl. XXXi. fig. 1.

This is proved from several instances of extra-uterine foetuses, where the uterus, though there were no contents, was nearly of the same size, from the additional quantity of fluids transmitted, as if the ovum had been contained within its cavity. Boehmerus\* relates the same circumstance, without attempting to explain it, in the history of a case of extra-uterine conception in the fifth month. The uterus is painted of a considerable size, though the foetus was contained in the ovarium.

The gravid uterus is of different size in different women; and will vary according to the bulk of the foetus and involucra. The situation also varies according to the increase of its contents, and the position of the body. For the first two or three months, the cavity of the fundus is triangular as before impregnation; but as the uterus stretches, it gradually acquires a more rounded form. In general, the uterus never rises directly upwards, but inclines a little obliquely; most commonly to the right side†: its position is never, however, so oblique as to prove the sole cause either of preventing or retarding delivery.

Though considerable changes are occasioned by the gradual distention of the uterus, it is difficult to judge

\* *Vide* Boehmeri Obs. Anatom. Rarior. Fasciculus notabil. circa uterum human. Observatio de Conceptione ovaria, tabula prima.

† See Dr. Hunter's Tables, Pl. i. iii. and iv.

judge of pregnancy from appearances in the early months. For the first three months, the os tincae feels smooth and even, and its orifice is nearly as small as in the virgin state. When any difference can be perceived, it will consist in the increased length of the projecting tubercle of the uterus, and and the shortening of the vagina from the descent of the fundus uteri through the pelvis. This change in the position of the uterus, by which the projecting tubercle appears to be lengthened, and the vagina proportionally shortened, chiefly happens from the third to the fifth month. From this period the cervix begins to stretch and be distended, first at the upper part; and then the os tincae begins also to suffer considerable changes in its figure and appearance. The tubercle shortens, and the orifice expands: but, during the whole term of gestation, the mouth of the uterus is strongly cemented with a ropy mucus, which lines it and the cervix, and begins to be discharged on the approach of labour. In the last weeks, when the cervix uteri is completely distended, the uterine orifice begins to form an elliptical tube, instead of a fissure; and sometimes, especially when the parietes of the abdomen are relaxed by repeated pregnancy, disappears entirely, and is without the reach of the finger in touching. Hence the os uteri is not placed in the direction of the axis of the womb, as has generally been supposed.

The progressive increase of the abdominal tumor, from the stretching of the fundus, affords a more decisive mark of the existence and period of pregnancy than any others; and the progress is nearly as follows.

About the fourth, or between the fourth and fifth month, the fundus uteri begins to rise above the pubes or brim of the pelvis, and the cervix to be somewhat distended. In the fifth month, the belly swells like a ball with the skin tense, the fundus extends about half way between pubes and navel, and the neck is sensibly shortened. In the seventh month, the fundus, or superior part of the uterine tumor, advances as far as the umbilicus; and the the cervix is then nearly three-fourths distended. In the eighth, it reaches midway between the navel and scrobiculus cordis; and, in the ninth, to the scrobiculus itself, the neck then being entirely distended; which, with the os tincae, become the weakest parts of the uterus. Thus at full time the uterus occupies all the umbilical and hypogastric regions: its shape is almost pyriform, that is, more rounded above than below, and having a stricture on that part which is surrounded by the brim of the pelvis\*.

During the progress of distention, the substance of the uterus becomes much looser, of a softer texture, and more vascular than before conception; and the diameter of its veins is so much enlarged that they

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\* *Vide* Dr Hunter's Tables, Pl. xvi.

have acquired the name of *sinuses*. They observe a more direct course than the arteries, which run in a serpentine manner through its whole substance, and anastomose with one another, particularly at that part where the placenta is attached: It is in this part also that the vascular structure is most conspicuous.

The arteries pass from the uterus thro' the decidua; and open into the substance of the placenta in an oblique direction. The veins also open into the placenta; and by injecting these veins from the uterus with wax, the whole spongy or maternal part of the placenta will be filled\*.

The muscular structure of the gravid uterus is extremely difficult to be traced with any exactness. In the wombs of women who die in labour, or soon after delivery, fibres running in various directions are observable more or less circular.

These seem to arise from three distinct origins, viz. from the place where the placenta adheres, and from the aperture or orifice of each of the tubes; but it is almost impossible to demonstrate regular plans of fibres continued any length without interruption.

The appendages of the uterus suffer also considerable changes; for the tubes, ovaries, and ligaments, gradually go off below the fundus as it stretches, and at full time are almost entirely obliterated. At full time, especially in a first pregnancy, when the womb rises

\* *Vide* Dr. Hunter's Tables, Pl. x. fig. 1. and 2. Pl. xv. fig. 1. &c.

rises higher than in subsequent impregnations, the ligamenta rotunda are considerably stretched ; and to this cause those pains are probably owing which strike from the belly downwards in the direction of these vascular ropes, which are often very painful and distressing towards the latter end of gestation. Again, as the uterus, which is chiefly enlarged towards the fundus, at full time stretches into the cavity of the abdomen without any support, leaving the broad ligaments below the most bulky part, we can readily see, that by pulling at the umbilical cord to deliver the placenta, before the uterus is sufficiently contracted, the fundus may be pulled down through the mouth of the womb, even though no great violence be employed. This is styled the *inversion of the uterus* ; and is a very dreadful, and generally fatal accident. It is the consequence only of ignorance or temerity ; and can scarcely happen but from violence, or from an officious intrusion on the work of nature, by pulling at the rope while the woman is faint or languid, and the uterus in a state of atony.

In some rare instances, the force of labour which propels the child where the cord is short naturally, or rendered so by circumevolutions round the body of the child, may, when the placenta adheres to the fundus uteri, bring it down so near the os tincae, that little force would afterwards be sufficient to complete the inversion. This suggests a precaution, that in the  
above

above circumstances, if strong labour-pains should continue, or a constant bearing down ensue, after the delivery of the child, the practice of pulling by the cord should be carefully avoided, and the hand of the operator be prudently conducted within the uterus, to separate the adhesion of the cake, and guard against the hazard of inversion\*.

The ovaria also suffer some change from pregnancy.

A roundish figure of a yellow colour appears in one of them, called by anatomists the *corpus luteum*; and in cases of twins, a corpus luteum often appears in each ovarium. It was imagined to be the calyx ovi; and is observed to be a gland from whence the female fluid or germ is ejected. In early gestation this cicatrix is most conspicuous, when a cavity is obvious, which afterwards collapses.

If the ovarium be injected in the latter month, the corpus luteum will appear to be composed chiefly of vessels. A portion of it, however, in the centre, will not be filled; from which it is, with some reason, suspected that it is a cavity, or that it contains a substance not yet organised †. S E C-

\* Of seven unhappy cases of inverted uterus where I have been called within several years, the consequence of ignorance or temerity of the practitioner, in one single instance only the woman survived the shocking accident. The other women had generally expired before any attempt could be made to relieve them.

† Vide Dr. Hunter's Tables, Pl. v.; Pl. xv. fig. 5.; Pl. xxix. fig. 3.; and Pl. xxxi. fig. 3.

## SECTION VI.

*Manner of Circulation between the Mother and Fœtus.*

AFTER many disputes on this subject, it is now generally allowed, that the communication between the parent and child is carried on entirely by means of the placenta, whose spongy surface adheres to the internal surface of the womb, and receives the finer part of the arterial blood of the mother by absorption. No anastomoses of blood-vessels between them have yet been clearly shown by the experiments of any physiologist; nor has any coloured injection been pushed from the uterus into the interior vascular part of the cake, nor from the fœtus or umbilical vessels into the cellular part, except by the force of extravasation. This cellular part of the placenta is probably derived from the decidua; and is not a spongy inorganic substance, merely intended for the attachment of the cake; but probably a regularly constructed and organised part belonging to the mother. The cells, therefore, cannot be filled by injection from the umbilical vessels, though an injection will readily pass from the vessels of the uterus.

We find the same structure obtain in cows, where the cellular can be easily separated from the vascular part, and the distinct property of each ascertained.

As the structure of the cellular part of the placen-

ta is somewhat similar to that of the more simple glands, it may be reasonably inferred, that it is intended for other purposes besides merely absorbing blood and conveying it to the umbilical vessels of the child. It seems probable, therefore, that an operation similar to secretion is carried in the placenta; that the veins and arteries of the fœtus, in the vascular part of the cake, are continuous; and that absorbents arise in the follicles, which soon terminate in veins. From this view it appears, that the placenta is not only the connecting medium between the mother and child, intended for conveying and returning nutritious fluid from the one to the other, but also changes and prepares it, in a particular manner, for circulating through the minute vessels of the delicate fœtus.

This mode of circulation is admirably well contrived for the preservation of the child from diseases which would otherwise be communicated from the mother, if the mutual communication were kept up by continuous vessels, the fœtus would constantly be in danger of suffering when the mother's circulation was accelerated or otherwise disturbed.

## SECTION VII.

### *Circulation in the Fœtus.*

**T**HE finer part of the arterial blood of the mother transmitted, in the manner just now mentioned, from the uterus to the placenta and conveyed a-  
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long the umbilical cord to the foetus for its support and increase circulates in the system of the non-natus in the following manner.

The blood passes directly from the placenta into the umbilical vein ; which running along the funis, perforates the belly of the foetus, and enters under the liver, where it divides into two branches, nearly at half a right angle. One of these branches, called the *ductus venosus*, carries part of this liquor immediately to the lower vena cava. The other carries the rest to the vena portarum ; where, after circulating through the liver, it also gets into the vena cava, and so to the heart : but the circulation here is carried on without any necessity for the lungs being dilated. For foetuses have an oval hole open between the two auricles of the heart, and a large communicating canal, called *canalis arteriosus*, going between the pulmonary artery and aorta ; which two passages allow the rest of this circulating fluid, that returns by the cava superior, to be transmitted to the aorta, without passing thro' the lungs.

The blood is returned from the foetus by the *arteriae umbilicales*, which take their rise sometimes from the trunk of the aorta, and sometimes from the iliac arteries of the foetus ; and, running by the external sides of the bladder, ascend to go out at the navel.

Thus there are three circulations belonging to the foetus, *viz.* one between the uterus and placenta, by absorption ; one between the placenta and foetus,

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by a continuation of vessels through the cord; and one within the fœtus itself.

## SECTION VIII.

*Position of the Fœtus in utero.*

THE fœtus is commodiously adapted to the cavity of the uterus, and describes an oblong or oval figure; its several parts being collected together in such a manner as to occupy the least possible space. The spine is rounded, the head reclines forward towards the knees, which are drawn up to the belly, while the heels are drawn backwards towards the breech, and the hands and arms are folded round the knees and legs. The head of the child is generally downwards. This does not proceed, as was commonly alleged, from the funis not being exactly in the middle of the child's body, for it is not suspended by the funis: the reason is, because the superior parts are much larger and heavier in proportion than the inferior. When other parts present, it seems owing to the motion of the child altering its figure when the waters are much diminished in quantity, or to circumvolutions of the cord: when the position is once altered, it becoms confined or locked in the uterus, and cannot easily resume its original posture.

As the figure of the fœtus is oval, and the head na-

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naturally

turally falls to the most depending part of the uterus, the vertex generally points to the os tincae, with the ears diagonally in the pelvis between the pubes and sacrum. The foetus is mechanically disposed to assume this position from its peculiar figure and construction, particularly by the bulk of the head and articulation with the neck, by the action of its muscles, and by the shape and construction of the cavity in which it is contained.

## SECTION IX.

### *Peculiarities of the Foetus.*

THE foetus, both in external figure and internal structure, differs materially, in many striking circumstances, from the adult. It is sufficient for our present purpose to mention a few particulars.

The head is very large in proportion to the rest of the body; the cranial bones are soft and yielding, and the sutures not yet united; so that the bulk of the head may be diminished in every direction, and its passage consequently be rendered more commodious. The bones of the trunk and extremities, and all the articulations, are also remarkably flexible. All the apophyses are epiphyses; even the heads and condyles and brims of cavities, instead of bone, are of a soft cartilaginous consistence.

The brain, spinal marrow, and whole glandular as  
well

well as nervous and sanguiferous systems, are considerably larger in proportion in the fœtus than in the adult. It has a gland situated in the fore-part of the chest between the laminæ of the mediastinum, called the *thymus*. The liver and kidneys are much larger in proportion; and the latter are divided into a number of small lobes, as in the brute.

The fœtus also differs in several circumstances from a child who has breathed.

The cavity of the thorax is less in proportion than after respiration. The lungs are smaller, more compact, of a red colour like the liver, and will sink in water; but putrefaction, and a particular emphysema, as in diseases of cattle, and blowing into them, will make them swim: which should prevent us from hastily determining, from this circumstance, whether a child has breathed or not; which we are often called on to do. Neither does their sinking prove that the child never breathed; for a child may die, or be strangled in the birth, or immediately after, before the lungs are fully inflated.

The arterial and venous systems are also different from that of the child. Hence the difference in the manner of circulation already taken notice of.

## SECTION X.

*Some Subjects connected with Gestation*

## I. SUPER-FOETATION.

SOON after impregnation takes place, the cervix and orificium uteri become entirely closed up by means of a thick viscid gluten: the internal cavity is also lined by the external membrane of the ovum, which attaches itself to the whole internal surface of the fundus uteri: the Fallopian tubes also become flaccid; and are, as gestation advances, supposed to be removed at so great a distance, that they cannot reach the ovaria to receive or convey another ovum into the uterus. For these and other reasons, the doctrine of super-fœtation, or the possibility of one conception soon after supervening another in the same woman, is now pretty generally exploded:—A doctrine that seems to have arisen from the case of a double or triple conception; where, some time after their formation and progressive evolution *in utero*, one fœtus has been expelled, and another has remained; or, after the extinction of life at an early period, one or more may still be retained, and thrown off in a small and purtrid state, after the birth of a full-grown child.

~~The uterus of brutes is divided into different cells; and their ova do not attach themselves to the uterus~~

so early as in the human subject, but are supposed to receive their nourishment for some time by absorption. Hence the os uteri does not close immediately after conception; for a bitch will admit a variety of dogs while she is in season, and will bring forth puppies of these different species.—Thus it is common for a gre-hound to have, in the same litter, one of the gre-hound kind; a pointer; and a third, or more, different from both: Another circumstance that has given rise to super-fœtation in the human subject, which can only happen when there is a double set of parts; instances of which are very rare.

## II. EXTRA-UTERINE FOETUSES, OR VENTRAL CONCEPTION.

THE impregnated ovum, or rudiments of the foetus, is not always received from the ovarium by the tuba Fallopiana, to be thence conveyed into the cavity of the uterus. For there are instances where the foetus sometimes remains in the ovarium, and sometimes even in the tube; or where it drops out of the ovarium, misses the tube, falls into the cavity of the abdomen, takes root in the neighbouring parts, and is thereby nourished: But they are always less than the uterine foetuses; they either do not receive so much nourishment as in the succulent uterus, or they generally come to their full growth long before their common term.

Some of these burst in the abdomen; others form abscesses, and are thereby discharged; others shrivel, appear bony, and are retained during life, or discharged by stool, abscesses, &c\*.

### III. MONSTERS.

EVERY considerable deviation in the structure of a foetus from the common order of nature is considered as monstrous, whether such deviation be consistent with life or not; and the production is commonly termed a *monster*. This idea of a monster will, however, comprehend all the variety that has been observed; and these we shall endeavour to reduce under four general heads.

1. Those productions which have supernumerary parts. These include all the variety, from the famous instance of the Bohemian sisters, who were joined together by the glutei muscles and the intestinal canal, to those foetuses which have only an additional finger or toe.

2. Those whose parts are defective; which has happened with respect to every part of the animal body.

3. Those who have any remarkable distribution of any of the vessels, nerves, or excretory organs, whether externally visible or not.

4. The productions of animals of different species, exemplified

\* Vid. Memoires de l' Acad. de Sciences; Philosophical Transactions; Manget. Biblioth. Anat.; Med. Essays; and Smellie's Cases.

exemplified in the mule produced by the mixed generation of an ass and mare.

It is very difficult to give an explanation of these deviations, nor indeed is it to be expected, while the process of generation is itself so great a mystery. If we allow with BONNET, &c. that a germ or embryo of the future production exists in the female previous to the impregnation, many of these deviations must to it be referred. Though this, however removes the difficulty, it by no means solves it. Supernumerary parts may be more readily accounted for: for if two ova become contiguous in their gelatinous state, they may easily unite: and this contiguity and union will prevent the evolution of many of the parts, and the production will appear as one. This we can say with some certainty has been often the case, as in the Bohemian sisters mentioned under the first species; and the union in the different monsters has at various times been seen gradually more and more complete, so that most supernumerary parts evidently proceed from this cause.

The causes of the other deviations are more obscure, and we can find no view which we can pursue with sufficient probability to be here mentioned.

PART II.  
PATHOLOGY.

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HAVING concisely described the several parts, and pointed out their uses, we should next proceed to the Operation ; but we must first consider those complaints which may prevent conception, and may be stiled the Pathology of *Generation* ; secondly, those which impede or retard delivery, or the Pathology of *Parturition*.

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CHAP. I.

PATHOLOGY of GENERATION.

THE diseases included under this division are, Topical affections of the parts, Irregularities of the periodical Evacuation, and diseases which are sometimes mistaken for Gestation.

SECTION I.

*Topical Diseases of the Genital Organs.*

THE *mons veneris* and *labia pudendorum* are liable both to *œdematous* and inflammatory swellings, and to tumors, chiefly of the *steatomatous* kind. The latter sometimes, from small beginnings, gradually en-  
large.

large to an enormous size : but as they commonly adhere by a small peduncle, their excision is a simple operation, and seldom followed with considerable haemorrhage ; they leave but slight marks behind them, and for the most part easily heal.

Oedematous swellings are of two kinds ; general or local. The first are the attendants of an universal leucophlegmasia, the consequence of a dropical habit ; and the treatment must then be conducted on general principles, with a view to correct the fault in the habit. The latter arise from venous plethora, and the pressure of the bulky uterus interrupting the returning blood from the lower extremities ; hence the serous part is extravasated, and forms a local oedema. The swelling at first appears on the feet and legs, and gradually extends to the thighs and labia. Though sometimes formidable, it is entirely symptomatic of pregnancy ; and for the most part, entirely subsides soon after delivery.

The *labia*, when inflamed or abraded ; from whatever cause, (as from the involuntary discharge of acrid urine, or any other acrimonious discharge which excoriates the parts), may grow together if not prevented by frequent bathing ; should this happen, they must be separated with a scalpel, and the like accident by proper care in future prevented.

The *clitoris* sometimes becomes enlarged greatly beyond the ordinary size. When incommodiouly  
elongated

elongated, amputation may be performed with safety. The enlargement of the *nymphæ* also requires the same treatment.

Extirpation of the *carunculæ myrtiformes* sometimes also becomes requisite; but *fungous excrescences* of these parts may generally be removed by caustic, or any more gentle escharotic application.

The *urethra*, too, is subject to disorders and accidents; such as fungous excrescences, contusion, laceration, inflammation, gangrene, and the stone.

The first of these may, when large, be cut out with the scissars, or destroyed by the application of the bougie. All the others, as now enumerated, may be the consequence of a stone sticking in the passage: when the expulsion cannot be forwarded by the semicupium, the stone must be extracted, either by dilating the urethra itself, or cutting upon it through the vagina. The symptoms of a stone in the female bladder, towards its neck, or in the urethra, are nearly similar to those which occur in the male, and the treatment and operation are too well known to require a description.

The *imperforated hymen* in some subjects shuts up the os externum entirely, and is expanded even to the meatus urinarius. It is seldom attended with inconvenience till the age of puberty, when the menses should appear; at which time a swelling or tumor is formed, by the confinement of the accumulating  
menstrual

menstrual blood. The quantity increases at every succeeding period; and, by the distention of the parts, excites the most troublesome and painful complaints. The cure consists in dividing the membrane by incision. The opening should be sufficiently large, that the whole contents may be freely evacuated: In some cases the thickness is so great, as to require the use of a trocar\*. The re-union of the lips of the wound must, by proper dressings, be carefully guarded against.

NARROWNESS OF THE VAGINA sometimes occurs. This may be either natural, from original conformation; or accidental, in consequence of disease. Cicatrices may be formed from a laceration after severe labour; in consequence of ulceration, erosion, &c. Preternatural constrictions may likewise be induced, from the use of styptic applications, or fumigations. The cure may be attempted by emollient fomentations; as by the steams of warm water directed to the parts; and by introducing a small tent of compressed sponge, which hath been previously moistened and kept tight bound with tape till dry. This by imbibing the moisture, will swell and expand; and thus the aperture will be gradually stretched. The tent must be withdrawn every day, by means of a thread fixed through its middle, and  
a lar-

\* *Vid* Edinburgh Med. Commentaries, Vol. II. part 2 Sect. ii. Case iv.

a larger one introduced in its stead. The sponge should be smooth, and lubricated with pomatum. This process must be continued, till the passage becomes sufficiently enlarged.

If these methods fail, recourse must then be had to the knife ; though, in the simple contraction of the cavity of the vagina this expedient is seldom necessary, and the attempt is often attended with the utmost danger ; therefore should never be determined on till every other method has failed. The dilation, which previous to impregnation seemed impracticable, has very often been accomplished by labour-pains.

Sometimes there is a natural defect in the genital parts, from an original mal-conformation ; so that the vagina is either imperforated altogether, or a foramen only remains sufficient to transmit the menstrual blood. If, from coalition of the parietes of the vagina, the passage be entirely shut up, an attempt to force it would be vain. The orifice in the latter case will afford a proper direction for the knife ; but the operator must be cautious not to mistake the urethra for the passage into the vagina.

When the vagina is imperforated altogether, the uterus has been sometimes wanting\*.

The *perinæum*, from the distention it suffers in time of labour, or from mechanical violence in delivery

\* Vid. Morgagni, de causis et sedibus morborum, Epistol. XLVI.

delivery, is subject to inflammation, tumefaction, laceration, and their consequences; and these, in some cases, are not confined to the perinaeum only, but even extend to the vagina, rectum, and bladder. If these complaints resist the common means of relief, such as frequent bathing, fomentations, cataplasms, &c. and terminate in gangrene, leaving behind them fistulous sores with callous lips, unless a cure be effected by time, they generally continue in a fistulous state, without a possibility of remedy.

The *uterus*, like other parts, may also be affected with various disorders: These are chiefly inflammation and its consequences; sarcomatous, fungous, and polypous tumors; stoney concretions, dropsy, tympanites, scirrhus and cancerous tumors.

When the *os tincae* is shut up, either originally, or by cicatrix in consequence of suppuration, laceration, ulceration, or the like, the case is generally incurable; except the menstrual blood by its weight force a passage, or point out the manner of procuring it: if that fails, a future sterility is the unavoidable consequence.

Original conformations of this kind seldom admit of any treatment, for this reason: Because, besides the imperviousness of the *os tincae*, the *uterus* itself sometimes appears a solid body without any cavity in the centre.

SARCOMATOUS, FUNGOUS, OR POLYPOUS TU-

I

MORS,

MORS, arise from all parts of the vagina and uterus. They happen to women at every period of life, but most frequently towards the decline. They generally proceed from an obstruction of the small glands of the parts, and are less or more difficult to discover or remove, as their origin is low or high in the vagina or uterus. Their texture or consistence is very different; sometimes they are tender and mucilaginous, like those in the nose; at other times firm and solid, like a wen. Their existence is discovered by a careful inquiry into the circumstances of the case, and by an examination of the parts; sometimes their basis is very considerable; though they generally adhere by a small neck. They sometimes, like scirrhi, continue indolent for many years; and are also liable to degenerate into scirrhus and cancer. In their mildest state, they are attended with perpetual stillicidium from the vagina, and sometimes with profuse and dangerous floodings. They must be carefully distinguished from *herniæ*, *prolapsus uteri*, and other tumors. Polypi, when curable by an operation, may generally be removed by ligature; a safer method than cutting with the scalpel, as they are often supplied with large blood-vessels, from which there may be danger of a fatal hæmorrhagy.

For fixing the ligature, the fingers of the operator will be sometimes sufficient. When this method fails, Dr HUNTER'S needle, or M. LEVRET'S double  
ble

ble canula for applying and fixing the ligature over the tumor, are the most simple and successful expedients. M. LEVRET's instrument is nothing more than a piece of flexible gold or silver wire, passed through a double hollow probe in the form of a noose: This is to be conveyed into the vagina, and carried over the tumor till it reach the base; the ends of the wire must be gently drawn, or it must be twisted round as tight as the patient can easily bear; the canula must afterwards be fixed to the thigh, and the wire tightened every day as it slackens. By this means the circulation in the tumor is stopped, and in two or three days the polypus will drop off. In fixing the ligature, the operator must be cautious not to mistake the tubercle of the os tincae for the polypous tumor; a blunder which would prove of fatal consequence to the patient.

STONE CONCRETIONS, and even WORMS, it is said, have been sometimes found within the uterus\*. Calcular concretions have indeed been discovered almost in every cavity of the human body; but such appearances rarely occur in the human uterus. There seems less probability of the existence of worms, except in cases of suppuration or cancer.

A COLLECTION OF WATER, called HYDROPS UTERI, is sometimes formed in this cavity; a disease

\* *Vide* Miscellanea Curios. Acad. Naturæ. Mem. de l' Acad. Royal des Scienc. Vol. II. &c.

ease which has been often mistaken for pregnancy, as the menses are generally obstructed. When the disease is ascertained by a fluctuation sensibly felt in the part, and if there should be no suspicion of real gestation, the water may be evacuated by introducing a finger, or the catheter, through the os uteri; if this seems impracticable, the constricted parts must be relaxed by warm baths and fomentations. After the evacuation of the water, the cure may be completed by suitable regimen, strengthening medicines, and proper exercise.

**TYMPANITES UTERI**, or *wind* pent up in this cavity, is always passed involuntarily, and frequently with considerable noise. The only cure is by the spontaneous contraction of the uterus, and by removing the discharge which may give rise to it; for this uncommon disorder is often connected with a morbid discharge from the vagina\*.

**SCIRRHOUS TUMORS** are seldom discovered till the disease has made considerable progress. An uneasy weight and bearing down, suppression of urine, fluor albus, uterine pain, and sometimes flooding, are the usual symptoms; but the touch of the enlarged indurated cervix or fundus uteri, in suspicious cases, will afford the most infallible criterion. These tumors, like similar complaints in other parts, tho' they may long remain in an indolent state, seldom admit

of

\* *Vide* Sauvage.

of relief from medicine, and generally at length degenerate into cancer. Nor is any good to be expected from Peruvian bark, sarsaparilla, or even the so-much extolled cicuta. The general health must then, in a very particular manner, be attended to, and the most urgent symptoms must be palliated. For this purpose, a cooling regimen, the moderate use of gentle laxatives, occasional bleedings, and opiates are the chief means.

A foetid bloody discharge, along with an increase of pain, heat, and itching, mark the ulcerated or cancerous state of the disease. The progress is then rapid; and the stench becomes intolerable even to the attendants as well as to the patient. The ravages of the disease are shocking; for stools, urine, blood, and matter, are sometimes discharged from one orifice. In these unhappy circumstances, little can be attempted by way of treatment, but to amuse the patient, by palliating the painful symptoms with opiates, and keeping the sores clean by injections, till death brings the only relief.

**PROCIDENTIA** OR **PROLAPSUS UTERI.** The uterus sometimes changes its place, and falls down into the vagina, frequently protruding through the os externum. The cause may either be general debility, or topical relaxation of the connecting parts, particularly of the vagina. The cure consists in the reduction and retention of the prolapsed part. When

peffaries are disagreeable, the uterus may be suspended by a bit of sponge: Gently restraining injections sometimes prove useful; but a long-continued use of them will as certainly be hurtful, so that they should always be employed with caution. The general constitution should be strengthened by a proper regimen, bark, mineral waters, and the cold bath.

The *ovaria*, in common with other glandular parts, are subject to disease, such as scirrhous, steatomatous, and dropical swellings; by which they become so much enlarged, as to occupy the whole abdomen. Such cases generally prove incurable. Tumors of the *ovaria* at length generally terminate in dropsy: the symptoms are analogous to those of the ascites; from which, however, they sometimes differ in several particulars.

In the beginning, the enlarged ovarium may be easily distinguished from the ascites, by the swelling and pain being circumscribed, and confined to one side; in the progress, by the advances being more slow and gradual; in its advanced stages, by some œdematous swellings of the leg and thigh on the side affected, and by one being able to feel it from the vagina. The cure differs in nothing very material from that of the true hydrops ascites\*. When the tumor points outwardly, the contents, whether water or pus, must be evacuated by a free opening; when gelati-

nous.

\* *Vide* Dr Monro's Treatise on the Dropsy.

nous or purulent, a constant drain, by means of a seton, may, in some cases, be employed with advantage. The patient must afterwards be treated in the usual manner. The extirpation of the ovarium, in a diseased state, has been by some authors proposed: but when the tumor is very much enlarged, and perhaps adhesions to the neighbouring parts are already formed, the excision would at least prove a difficult, if not a very hazardous operation.

The *Fallopian tubes* are also liable to disease. Water is sometimes collected in them, and either floats through the whole cavity of the tube or each end coalesces in consequence of some inflammation, and the water appears to be contained in a cyst. It is difficult to be distinguished from the diseased ovarium, with which it is often complicated, and requires a similar method of treatment.

*Foetuses* or *Bones of Foetuses* are sometimes found in the tubes or ovaria; but they seldom make considerable progress, and ought never to be cut upon and extracted, unless when they point outwardly, or form abscesses.

## S E C T I O N II.

### *Irregularities of the Menstrua.*

THESE comprehend *Am&enorrh&ea*, *M&enorrhagia*, and *Leucorrh&ea*; and each distinct genus a considerable variety of species.

I. Am-

I. AMÆNORRHOEA consists of two species.

1. The retention or absence of the menses beyond their usual period of appearance, called *emanatio mensium*.

2. An interruption in the periodical revolution, after the law of habit is established, styled *suppression* or *obstruction*.

1.] The *Retention of the Menses* proceeds from different causes; and may be referred to general debility of the system, which impairs the action of the heart and arteries: or to some fault in the uterus itself, as torpor or rigidity of the vessels. The first produces symptoms of debility, which are generally styled *chlorotic*: and the indications of cure are, to strengthen the stomach and system; which is chiefly effected by bark, chalybeats, regimen, and the cold bath. Torpor and rigidity of the uterine vessels may be sometimes removed by the means usually employed for relaxing torpor and rigidity of the whole system: or by promoting the action of the uterine vessels, more particularly by stimulating the neighbouring organs. This is chiefly to be attempted in those cases where nature makes an effort; but, from debility or some other circumstance, is unable to accomplish it. She is then to be gently assisted, not forced. Aloetic purges, tinctura melampodii, small doses of calomel, or electricity, are the usual remedies; but they ought to be cautiously and prudently used. Tinctura fuliginis, or an extract

extract prepared from it, and given in the dose  $\text{ʒj}$  twice or thrice a day, is a more safe, and often most efficacious medicine in the latter case, along with the foetid gums. But the warm bath, or a change of climate, are the most powerful antispasmodics, and may be often successfully employed when other remedies fail.

Though we are in general able to distinguish these two causes of debility and torpor, yet it must be allowed, that retention of the menses, from every cause, soon induces a debility, which, without some attention, may be mistaken for the original defect.

2.] *Suppression of the menses.* The evacuation may be deficient in periods or quantity. The first is more properly termed *suppression*, or, in vulgar language, *obstructions*; the latter *sparing* or *painful menstruation*

1. *Suppression.* The menses are rarely suppressed in consequence of weakness: though it must be observed, that they are readily affected by any general disorder in the habit; and, in that view, the deviation is to be considered merely as symptomatic: and the cure will depend on correcting the fault in the constitution.

Spasm, or rigidity of the uterine vessels, is, perhaps, a more frequent cause than any other, occasioned, more remotely, by cold, irregular passions, plethora, &c. The cure must then be directed with a  
view

view to remove the constriction of the uterine vessels, and adapted to particular constitutions and symptoms. Venaesection, the warm bath, and emmenagogues, suited to the peculiar circumstances of the case, are the proper remedies. Medicines under the name of *emmenagogue* are not, however, to be relied on; and the means employed for restoring the evacuation are most successfully exhibited when our efforts concur with these of nature. Violent uterine emmenagogues, so far as they may have any tendency to affect the general health, are always improper and frequently hurtful. In a simple suppression, it is often sufficient to keep the patient quiet; to avoid cold, and irregularities of diet; with the use of the warm bath, semicupium, or steams of water directed to the uterus, when the expected period approaches.

When the suppression is more obstinate, aloetic purges, electricity, and the most powerful relaxants and antispasmodics, must be employed.

2. *Dismaenorrhœa, sparing, difficult or painful menstruation.*

Some women menstruate with difficulty, the uterine efforts to throw out blood are painful and imperfect, the discharge is scanty; but the appearance continues for many days: during which the irritation is communicated from the uterus to the neighbouring parts, and, by sympathy, all over the system; very generally producing pains about the articulation of the sacrum, from thence to the ilia and  
down.

down the thighs ; and not unfrequently attended with sickness and retching, nervous symptoms, or a slight degree of hysteria.

These symptoms are best relieved, by avoiding cold and irregularities for several days preceding the accustomed period ; by using actual warmth then, and more particularly during the time of menstruation ; by drinking, every night before bed-time, and in smaller quantities through the day, any mild, diluting, tepid drinks ; by frequent rest on a bed or sofa ; and, occasionally, by the use of opiates.

II. MÆNORRHAGIA.—The menses are only to be considered as excessive, when the periods recur so often, the duration is so long, or the quantity evacuated so great, as to induce debility, with its usual symptoms. In all these cases, Leucorrhœa is a frequent attendant. The causes may be active or passive, in common with other preternatural hæmorrhagies. Of the former are, Plethora, universal or local ; increased action of the vessels from fever ; excessive exercise, passions ; stimuli applied to the uterus, or neighbouring parts ; and every cause which determines the blood more forcibly to the uterus. Of the latter, Relaxation, universal or local. To distinguish *active* from *passive* mænorrhagia, is of the utmost consequence in directing the treatment.

In the *first* case, which is generally preceded with headach, oppressed breathing, attended with heat,

heat, thirst, quick full pulse, and other febrile symptoms, she must be exceedingly cautious of giving a sudden check to the flow, till the vessels have been sufficiently emptied, naturally from the discharge, or by the prudent use of venesection. A spare cooling diet, cool air, open belly, and the strictest antiphlogistic regimen, are then essentially necessary. Heat, violent agitations and exercise, and every corporeal and mental exertion, should be avoided.

In *passive* maenorrhagia, the discharge, must be moderated by styptics and opiates given internally; by cold wet applications to the pubes and external parts; by confinement to a horizontal posture on a firm bed, with hair matress, and few bed cloaths; by giving cold astringent drinks; and by avoiding every cause of irritation.

The vis vitae must be duly supported by nourishing diet; but while the flow continues, every thing of the stimulating kind under the name of *cordial* must be very cautiously used.

When the haemorrhagy hath entirely ceased, the interval must be improved to use the proper means for restoring the constitution. Of these, strengthening diet, the moderate use of cordials, gentle exercise, the Peruvian bark, and chalybeates, are principally to be relied on. In some passive cases, the flow is almost constant cordials and tonics are then particularly indicated: and gentle exercise in a carriage has been often known to moderate or suppress the flow.

Under

Under this article of *Maenorrhagia* may also be mentioned,

*Irregularities towards the cessation of the menstrua.*

The menses generally become irregular towards their final cessation. This critical period in the female constitution is commonly announced by irregular interruptions, unexpected returns, or immoderate discharges; in many instances, by excessive, long continued, or frequent and alarming floodings. The symptoms assume a variety of appearance, as influenced by constitution, habit, manner of life, and the state of the uterine system. They are rather to be considered as the consequence of a general change in the constitution, which terminates the age of child-bearing, than merely the effects of an accidental interruption, or excess of the periodical evacuation.

Every important change which the constitution suffers, is introduced by slow and insensible degrees: the alarming symptoms which at this period occur, proceed from the decline of life strictly speaking, a diseased state of the uterus, or may be ascribed to mistaken management. In some women, the menses take their leave more abruptly; in other, more slowly; and no material inconvenience is perceived in either case. Women who never had children, nor enjoyed good regular health, or whose constitution is impaired by frequent labours or miscarriage, the ner-

vous and delicate, are more commonly the subjects of complaint towards this period.

The particular symptoms and constitution, the age of the patient, her manner of life, and other circumstances formerly mentioned, will direct the proper treatment.

If no obvious inconvenience arises from the absence of the menses, it would surely be absurd to injure the constitution by a sudden change of manner of living, by abstemious diet and debilitating evacuations. On the contrary, if the symptoms indicate a full habit and plethoric diathesis, venesection, purgatives, and spare diet, will then be necessary.

Frequent or immoderate floodings, attended with symptoms of debility, must be treated as already directed. In relaxed weakly women, the consequences are always to be less or more dreaded: the flux must be checked by cold wet applications; the painful symptoms relieved by opiates; and the constitution afterwards strengthened by nutritious diet, bitters, &c.

Shooting pains about the region of the uterus, the pubes, and breasts, along with frequent floodings, or leucorrhœa, indicate suspicion of scirrhus or cancerous disposition, and are generally preludes of disease which soon ends fatally, or renders the remains of life uncomfortable.

Floodings, seemingly alarming and hazardous  
from

from their excess or frequency, are never to be dreaded, while no quantity of clots or concretions are voided, while they are unaccompanied with violent pain in the hypogastric region or other symptoms of morbid predisposition. They may generally be moderated by some of the means formerly recommended in *mænorragia*; and if the strength be kept up, though the hæmorrhagy may occasionally recur at vague and irregular periods, even for two or three years, I have never, in the course a long practice, known it to end fatally in a single instance: a complete recovery is generally at last accomplished, and the constitution restored, with the prospect of a state of good health for a considerable time after.

III. *LEUCORRHOEA, Fluor Albus, or Whites,* is a discharge of serous or mucous matter of a whitish colour, from the vagina. Its source is chiefly supposed to be from the vessels which pour out the menstrual blood; and the discharge is therefore considered as a mere depravity, or morbid state, of the catamenia: but it probably often proceeds from the glands at the cervix uteri, and not unfrequently from the lacunæ of those of the vagina; for many women subject to leucorrhœa have the discharge nearly of the usual appearance and quantity during pregnancy, and it is more seldom observed to be periodical. Its colour and consistence vary according to the nature and duration of the disease, the constitution, season, climate,

mate, and other circumstances. It is probably mild and serous when first poured out; afterwards, by stagnating, becomes more thick and acrid, varying also in colour and odour.

Few women, somewhat advanced in life, especially those who have had children, who have been subject to miscarriage, or irregularities of menstrua, are entirely free from it. The inactive and sedentary; full, jolly, or flabby women; and the relaxed and weakly; are especially liable to it.

Pain and weakness of the back and loins, dyspepsia, and the other symptoms of debility and indigestion, supposed to be its almost constant attendants, only occur when the discharge is excessive or very long continued. From quantity, or acrimony, especially in warm weather, in gross habits, or from neglect to keep the parts clean, painful excoriations are frequently occasioned: in that state it may be readily confounded with *gonorrhœa*.

The cure must be regulated by particular circumstances. Gross habits, and those who have been accustomed to full rich diet, with little exercise, require frequent purging, along with a mild spare diet and cooling regimen. In weakly relaxed constitutions, the indications are, To restore the tone and vigour of the system, by proper regimen; bark, mineral waters, with steel and alum, and the cold bath.

In

In either case, the parts should be kept clean by frequent cold bathing. Any gently astringent wash, after general evacuations, may be freely used in the former case: and in the latter, injections of alum-water, *tinctura rosarum*, or *bals. traumatic.* in a very dilute state, or washing the parts with a sponge soaked in the styptic liquor, often sensibly diminish the discharge; and, in recent cases, entirely remove it.

Gellies of hartshorn, or *ichthyocolla*, *bals. capivi*, and topical astringent injections and washes, are the best palliatives.

*Leucorrhœa* may be distinguished into *local* and *general*; a morbid affection of the parts, or a weakness of the system. In the former case, astringent washes or injections; in the latter, tonics, as bark or bitters, with lime-water, have the best effects. It is supposed that absorbents act by neutralizing the superabundant acid in the stomachs of such patients, and so removing one debilitating cause.

FUROR UTERINUS. There is a species of fluor albus, described by many authors under the name of *furor uterinus*. But even the existence of that disease is as confidently denied: We can at least with confidence assert, that the real nympho-mania is rarely known in this country. Nothing farther is probably meant by it, than an increased acrimony of the fluor albus, occasioning heat, pain, itching, and of con-

sequence irritation in these parts. The cure must therefore be conducted nearly in the same manner as in the former disease: The parts should be constantly kept clean by frequent bathing, or injections; of these a dilute solution of sacch. saturni in rose-water has been generally found to prove the most successful; a cooling regimen must also be enjoined, and occasional causes counteracted. Sometimes the centre of this irritation has been discovered within the urethra, when the bougie has proved the cure.

**STERILITY.** From most of the preceding complaints, and from various other diseases incident to those parts, the uterus may be unfit to receive or retain the male seed; or the tubes may be too short, or may have lost their erective power: in these cases, no conception can take place. Or, either from universal debility and relaxation, or a local one of the genital system, the tone and contractile power of these parts may be destroyed, so that the semen is thrown off immediately *post coitum*; which will in like manner occasion sterility. These causes of barrenness are obvious; for where the aperture of the vagina, or of the uterus was impervious, there is not one instance of conception to be found in the records of medicine. The same effects generally follow from imperforation of the tubes, or diseased ovaria.

There are, however, many other causes of sterility; but

but these, while the manner of generation is a mystery, are beyond the power of physiological investigation.—Hence medical treatment can only avail in cases arising from universal and topical debility; in correcting irregularities of the menstrual flux, one of the most common causes of barrenness; and in removing tumors, cicatrices, or constrictions of the passages, by the art of surgery.

### SECTION III.

#### *Diseases sometimes mistaken for Gestation.*

**V**ARIOUS diseases incident to the uterine system, and other morbid affections of the abdominal viscera, frequently excite the symptoms, and assume the appearance, of uterine gestation\*. Complaints arising from a simple obstruction, are sometimes mistaken for those of breeding; and diseased tumors any where in the pelvis, or about the region of the uterus, so nearly, in some instances, resemble pregnancy in their symptoms, that the ignorant patient is often deceived, and even an experienced physician imposed on.

SCIRRHOUS, POLYPOUS, or SARCOMATOUS TUMORS, in or about the Uterus or Pelvis; Dropsy or TYMPANITES of the Uterus or Tubes; STEATOMA or Dropsy of the Ovaria, and VENTRAL CONCEPTION,

\* Vid Morgagni de causis et sed. Morb. Ep. xlviiii.

TION, are the common causes of these falacious appearances. In many of these cases, the menses disappear; nausea, retchings, and other symptoms of breeding ensue. Flatus in the bowels is mistaken for the motion of the child; and in the advanced stages of the disease, from the pressure of the swelling on the adjacent parts, tumefaction and hardness of the mammae supervene, and sometimes a viscid serous fluid distills from the nipple. These circumstances strongly confirm the woman in her opinion; till time, or the dreadful consequences that often ensue, convince her at last of her fatal mistake.

FALSE CONCEPTION. MOLA. Other kinds of spurious gestation, less hazardous in their nature than any of the preceding, may under this article also be classed.

When the foetus is deprived of life, and dissolved in the early months while it is in a gelatinous state, the placenta often remains for some time in the uterus; its bulk is increased by additional coagula, and its consistence in consequence of absorption. When it is excluded in this state, it is called a *false conception*. When it remains longer, and acquires the consistence of a scirrhus, without any traces of its ever having been an organic body, it is called a *mola*.

Mere coagula of blood, retained in the uterus after delivery, or after immoderate floodings at any period of life, and squeezed by the resistance of the uterus,

into

into a fibrous or compact form, constitute another species of mola, that more frequently occurs than any of the former. These, tho' they may assume the appearances of gestation, are generally expelled spontaneously, and are seldom followed with dangerous consequences.

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## C H A P. II.

### *PATHOLOGY of PARTURITION.*

**T**HE changes introduced by conception, frequently prove the source of disorders which assume a variety of appearance in different constitutions, and at different periods of pregnancy. These complaints are sometimes troublesome, but they seldom injure the constitution; their effects are generally temporary, their appearance and duration vague and irregular.

Some women, soon after conception, suffer the most violent sickness and feverish indisposition, which harrasses and distresses them for several months; and, in some instances, continue during the whole term of gestation. In others, the breeding symptoms disappear after the early months. Many women feel no inconvenience but from the weight and pressure of the bulky uterus in the advanced months; while others.

thers enjoy a more than usually good state of health and spirits in these situations.

In the pregnant state, the courses are generally stopped; and consequently, the determination of the blood is altered: from this difference of determination many of the symptoms of pregnancy may be accounted for; particularly the appearance of general, and sometimes of a local, plethora. It must be confessed, however, that many of the symptoms appear to be entirely of the nervous kind, and not readily explicable in the present state of our Physiology: but they are such as the stoppage of any accustomed evacuation will often produce.

In the advanced states of pregnancy, the pressure of the uterus on the surrounding parts produces many others, which we can with more certainty refer to their proper cause.

## SECTION I.

### *Diseases of Pregnancy in the early Months.*

**T**HE most common symptoms of breeding are, sickness and loathing, vertigo and drowsiness, heartburn and diarrhoea, painful tension of the mammæ, nervous fits, deliquia, &c.

**SICKNESS AND LOATHING.** A slight degree of feverish indisposition, nauseating sickness, or vomiting, chiefly in the morning and after food, are in

in some instances almost coeval with conception; and the appetite is so whimsical and capricious, that the most extravagant and unaccountable substances are anxiously wished for.

The sickness from breeding is sometimes so severe as to resemble sea-sickness, and it is often as little in our power to relieve it. These early symptoms have been generally ascribed to the stoppage of the menses, altho' they commence often before the obstruction occurs. In many constitutions, however, particularly in the young and healthy, a certain degree of plethoric disposition, even in the more early periods of pregnancy, seems to prevail; small bleedings, therefore, where the sickness is attended with flushings, dry parched mouth and fauces, vertigo, or any other symptoms of fever, are safe and beneficial, and often give all the relief in our power to afford. Although a rash, indiscriminate, or frequent use of venæsection is to be guarded against as a hazardous expedient; on the contrary, if prudently employed, it may often be the means of preventing abortion. It may be safely performed at any time of gestation, and repeated according to the urgency of the symptoms. But small bleedings are always to be preferred to copious evacuations; which, in every period of pregnancy, especially in the early months, when the hazard of miscarriage is greatest, should be avoided.

When the stomach appears affected, along with constant

stant loathing, or frequent retchings, the offensive matter should be discharged by gentle vomits of ipecacuan, or of infusions of chamomile flowers or of carduus. The violent efforts of natural vomiting, which threaten the most disagreeable consequences, and sometimes actually throw off the conception, are in some instances entirely removed, in many cases greatly diminished, after the operation of a gentle emetic.

Small doses of rhubarb should be given to keep the body moderately open: the patient should also be put on a course of light, aromatic, and strengthening bitters; and her diet, air, exercise, and amusement should be properly regulated.

In constitutions of the nervous irritable kind, opiates sometimes procure a temporary relief from sickness and vomiting, when every other remedy fails.

**VERTIGO AND DROWSINESS.**—These proceed from fullness and plethora, connected with a particular state of the nervous system. Small bleedings when very troublesome, gentle exercise, an abstemious temperate diet, and every means of obviating plethora, and diverting the attention by promoting a cheerful state of mind, are the best remedies.

**HEARTBURN, DIARRHOEA, &c.** are common symptoms of breeding-sickness, and must be treated nearly in the same manner as similar complaints from other causes. They chiefly depend on the state of the  
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the stomach, peculiarly influenced by that of the uterus. The ascendent tendency of the stomach should be obviated, and the digestive faculty restored.

**TUMEFACATION, TENSION, and PAINS in the MAMMAE.**—If tight lacing be only avoided, and the breasts be permitted to expand, no material inconvenience will arise from their enlargement. These symptoms are the natural consequence of a natural cause, and seldom require medical treatment. If they should be very troublesome and uneasy, bathing with oil, or anointing with pomatum, and covering them with soft flannel or fur, will in most cases lessen the painful tension. In plethoric habits, where painful hardness and swelling are excessive, and do not readily yield to more simple remedies, venesection and gentle purging may be necessary.

**DELIQUIA, NERVOUS or HYSTERIC FITS**—Lowliness and depression of spirits are incident to the early stages of pregnancy, and are merely the effects of uterine irritability communicated to the nervous system; for the mind, as well as the body, is *then* peculiarly susceptible of irritation.

**FAINTINGS** more seldom occur, but about the term of quickening. They seem to arise from the sudden change of position of the uterus, emerging from its more close confinement within the bony parietes of the pelvis, and from the irritation communicated by the child's motion. They are commonly

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slight

flight and transient, and leave no bad effects behind them.

**DELIQUIA**, which are occasioned by falls, frights and passions of the mind, are of more serious consequence, and the shock is frequently fatal to the child.

THE complaints which occur in the early months require a variety of treatment in different circumstances. When symptoms of fullness appear in young women, formerly healthy and accustomed to live well, indicated by pain or giddiness of the head, flushings in the face and palms; or when the sickness is constant or excessive; venesection, an open belly, with abstemious diet, and every other means to obviate plethoric disposition, must be used. But, in opposite circumstances, where there is appearance of nervous delicacy, along with symptoms of dyspepsia and consequent debility, bleeding must be avoided with the strictest care. Nourishing diet given in small quantities and often repeated, the moderate use of cordials, good air, cheerful society, easy exercise, variation of scene, suited to the peculiar circumstances of the patient, and, in a word, those means adapted to sooth or diminish sensibility and irritability of the system, and keep up the general health, are the most proper.

## SECTION II.

*Diseases of advanced Pregnancy.*

**T**HE disorders which attend the advanced months of gestation, are more sudden in their occurrence, more painful in their symptoms, and more dangerous in their consequences, than those of the early months. The loss of the child, and a temporary weakness, from which the mother, under proper management, soon recovers, are the worst consequences to be dreaded from the latter: But, from the compression of the bulky uterus on the contiguous viscera, their important functions are impaired, the circulation in the vascular system, and nervous influence, are materially interrupted, and the most fatal event is sometimes produced.

The disorders incident to advanced gestation chiefly are,—suppression or difficulty of passing urine, retroverted uterus, costiveness, piles, œdematous swellings, varices, colic, cramps, pains in the back or loins, cough, dyspnoea, vomitings, strangury, or incontinence of urine, convulsions, &c.

**ISCHURIA and FREQUENT MICTURITION.** These symptoms are occasioned by the pressure of the uterus on the neck of the bladder, before the fundus uteri rises above the brim of the pelvis. The retention of a small quantity of urine then is a powerful stimulus

stimulus to void it. If that is neglected, and the bladder becomes distended, painful ischuria ensues. Women under these circumstances should be cautioned to avoid crowded places, and every situation which exposes them to disagreeable restrictions. A slight degree of suppression, if early attended to, will seldom prove troublesome or hazardous. It only requires a constant attention to obey the dictates of nature, when the call to evacuate the urine is urgent; to keep the belly regular; to lie down on a bed or sofa from time to time, when pained or uneasy; and carefully to guard against fatigue, and confinement in a crowded place, till the uterus be so much enlarged, as to be supported by resting on the expanded bones of the ilia.

### RETROVERTED UTERUS.

As the gravid uterus enlarges, it sinks downwards, till it becomes too bulky to be longer confined within the bony cavity: but if, from the uncommon capacity of the pelvis, any extraordinary exertions, violent fatigue, obstinate costiveness, or the distention of the bladder with urine, the uterus should be prevented from emerging above the brim of the pelvis, the fundus will sink lower and lower, falling backwards into the inferior posterior part of the pelvis; the os tincae will then be drawn upwards towards the  
pubes

pubes, making the superior part, and the fundus forming the most depending part of the tumor.

This reflected state of the prolapsed gravid uterus is styled *retroversion*; and is readily known by the symptoms, and from the period of pregnancy in which it occurs.

It chiefly occurs between the third and the end of the fifth month of pregnancy. The symptoms are, an increase of those usually occasioned by painful distention of the bladder with urine, constant weight, and uterine pain and pressure, tenesmus and other symptoms sometimes resembling the severest throes of labour. A tumor will be also felt to the touch between the vagina and rectum, which occupies the whole inferior capacity of the pelvis, prevents the finger from passing into the vagina, and presses against the perinaeum and anus, like the child's head in time of labour.

In the beginning of the disease, the urine is voided with difficulty; in the progress, stools and urine are totally retained. As the bladder distends, it draws the cervix uteri up with it; the uterus, growing bigger and bigger, sinks lower, spreads out beyond the inferior circumference of the pelvis, and occasions constant straining and pressing. The throes at last become so violent, that the uterus seems ready to be protruded without the vulva. The inferior lateral openings of the pelvis yielding to the distending cause,

as they do in real labour, the tumor becomes so bulky, as, in some instances, to elude the possibility of reduction\*. Laceration of the coats of the bladder, inflammation communicating to the viscera, delirium or convulsions, and the most fatal event, soon ensue, if the means of relief are neglected or prove ineffectual.

The cure consists in restoring the uterus to its proper position, and guarding against the hazard of relapse.

Previous to attempting the reduction of the uterus, the counteracting obstacles must be removed. With this view, repeated venesection may be necessary; fomentations; or the semicupium, should be used to diminish swelling and inflammation; the catheter should be passed to evacuate the urine; and the rectum should be washed out with repeated glysters.

The reduction of the uterine tumor should then be attempted, by placing the patient on her knees and arms, with her head reclined and properly supported, endeavouring, by every possible means, to restore the uterus to its proper position. The force employed should be gentle at first, pressing backwards and upwards in different directions, (to draw the os tincae down from the pubes), not by starts, but constantly and

\* *Vide* Dr Hunter's Plates of the Gravid Uterus, Pl. xxvi. London Medical Observations and Inquiries; Vol. IV. art. xxxvi

and equally, gradually increasing the exertions of force, as far as they can safely be carried, till the end in view be obtained.

After the reduction the patient must be confined mostly to bed, and the distention of the bladder and rectum must be carefully prevented, till the uterus rises above the brim of the pelvis, when she will be secured from future danger. But if the obstinacy of the disease should render every effort ineffectual either to evacuate the urine or replace the uterus, it has been proposed to puncture the bladder at the pubes; and, if that should fail to facilitate the reduction, to thrust a trocar into the substance of the uterus to procure abortion; or to enlarge the pelvis by incision at the symphysis pubes, in order to accomplish the reduction of the uterus.—The two first proposals are shocking and desperate: the last gives a more reasonable prospect of saving both the mother and child.

**COSTIVENESS.** This symptom is a common attendant of pregnancy. The occasional causes are, the pressure of the gravid uterus, a disordered state of the stomach, and sedentary life.

It may be obviated or prevented, by attention to diet, and the occasional use of gentle laxatives; of these ripe fruit, magnesia, cream of tartar, soluble tartar, lenitive electuary, ol. ricini, or an aloetic pill, when the patient is not subject to any hæmorrhoidal affection,

affection, or has been formerly accustomed to it, are the most proper.

But in cases of obstinate costiveness, to break down and remove indurated scybali, emollient glysters, occasionally rendered moderately stimulent with soap, or a small proportion of common salt, ought to be repeatedly exhibited.

**PILES**—are small tumors placed a little way within the rectum, or protruding like varicous swellings without the verge of the anus, attended with throbbing pain, heat itching; frequently with fever and restlessness, and sometimes liable to frequent or excessive haemorrhages. Their occasional causes chiefly are, costiveness, and venous plethora from gestation.

The treatment should be directed nearly on the same principles as similar cases from other causes with the precaution which pregnancy suggests. Costiveness must be obviated by cooling laxatives: of which cream of tartar and flowers of sulphur are the best. General or topical bleedings should be used, to lessen plethora or local inflammation; and fomentations and cataplasms, emollient or saturnine applied, to disperse the swelling or promote suppuration. For allaying the pain often attending piles when the inflammation is removed, *pulv. gallarum* and *axung. porc.* in the form of ointment, has been much recommended.

commended. *Bals. copivi* is also an excellent remedy in piles, and keeps the belly moderately open.

**OEDÆMATOUS SWELLINGS** of the *Legs*, and sometimes extending to the thighs and labia, arise from the same cause with the preceding complaint, viz. venous plethora from the pressure of the uterus. They are merely symptomatic, and only attended with a temporary inconvenience; as almost in every instance, where the constitution is otherwise unimpaired, they subside immediately after delivery.

The best palliatives are—small bleedings and gentle purgatives, with a light spare diet, if the patient be full and plethoric; if otherwise, strengthening diet, the moderate use of cordials, an open belly, frequent rest on a bed or couch: and in either case, easy exercise when she is able to bear it, and friction with a flesh-brush, applied to the legs evening and morning, to promote the circulation and absorption of the stagnant fluids.

**VARICOUS SWELLINGS** are merely distentions of the coats of the veins from venous plethora, occasioned by pressure of the gravid uterus. They are generally confined to the legs or thighs, and seldom proceed so far as to burst and throw out their contents. When very large or painful, gentle evacuations may be necessary; and topical astringent applications used, to remove local laxity; as compresses soaked in any styptic liquor, and retained by  
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the application of a bandage. A moderate pressure on the part by compress and bandage, when the accumulation is considerable, will, in most cases be sufficient to remove any inconvenience occasioned by the swelling till delivery; soon after which, they generally disappear, or are considerably lessened.

**PAINS** in the **BACK** or **LOINS**, **COLIC**, **CRAMP**—are occasioned by the stretching of the uterus, or by its pressure on the neighbouring parts, particularly on the diaphragm. They are most troublesome in a first pregnancy, or when the distention of the abdomen is enormous.—Small bleedings, gentle laxatives, a light spare diet, and occasional opiates, are the best palliatives.

If the patient be of a full habit, and where a disposition to inflammatory complaints prevails, any violent fixed pain about the back or loins, along with fever, or in the abdominal viscera, exciting symptoms of *Colic*, is highly alarming and dangerous in advanced gestation where the pressure is great. The threatening event can only be prevented by repeated venesection, and the antiphlogistic treatment.

*Cramps* are sometimes very troublesome towards the latter end of gestation. They are chiefly confined to the legs and thighs, more rarely they affect the belly, and are most troublesome during the night. Their occasional causes are, the stretching of the

the womb, or its continued pressure on one particular part.—When frequent or violent, and the habit is full or plethoric, bleeding is necessary. The sudden exposure of the body to cold, or change of posture, as getting out of bed and walking about, may be often sufficient to give a temporary relief; and opiates may be useful to lessen nervous irritability.

**COUGH, DISPNOEA, VOMITINGS, DIFFICULTY OF INCONTINENCY OF URINE**—The cause in advanced gestation is sufficiently obvious. The former of these symptoms are chiefly to be alleviated by small bleedings, gentle laxatives, light spare diet, and opiates. The patient should be placed, when in bed, in an easy posture, with her head and shoulders considerably raised, and the bed-room should be as large and airy as possible. Bandages, advised by many when the uterus rises very high, are dangerous expedients for altering its direction; and stricture in dress, with a view to hamper and confine the uterus, can never be employed with safety.

To prevent the consequences of frequent micturition, or incontinency of urine, a suspensory and thick linen compress, or sponge, should be constantly worn, and occasionally shifted as it becomes damp.

### CONVULSIONS.

THE appearance of epileptic fits in pregnant women is frightful; the symptoms are alarming; and the event is always precarious, often fatal.

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The paroxysms generally come on without any obvious prelude. Headach intolerably violent, or intense pain or oppression about the praecordia, are the most common presaging symptoms.

At whatever term of gestation, there is great danger; but, in the advanced months, the disease is more desperate. The danger is also to be judged of by the violence of the symptoms, the duration and recurrence of the fits, connected with the occasional cause and constitutional temperament of the patient, and from her condition during their remission.

The remote causes are, Increased irritability from pregnancy, particularly uterine irritability communicated by sympathy to the encephalon, in some instances probably originating from the struggles or convulsive motions of the foetus, arising from its awkward or hampered position; and pressure of the gravid uterus interrupting the circulation through the abdominal viscera, disturbing their functions, and changing the determination both of the circulating fluid and nervous energy. They may also arise from inanition, in consequence of profuse haemorrhagies, or other debilitating evacuations; or be occasioned by mechanical injury of the uterus, from violent bruises, wounds, &c. and by passions of the mind, and other occasional causes, sufficient to bring on convulsions in the unimpregnated state.

Hysterical or nervous spasms are readily distinguished from

from convulsions. The former are milder than the latter in their symptoms; and much less frightful in appearance, by the absence of foamings and distortions: They have no sensible effect in bringing on labour; they are seldom followed with bad consequences; and yield to the common treatment. Women of vigorous constitutions, rigid fibres, and plethoric habits, are more usually the subjects of the latter: the delicate, the nervous, and irritable, of the former.

Convulsions, during pregnancy, may be referred to three distinct periods at which they may occur; those of the early months, those of the latter, and those that come on along with labour.

1. Those which appear in early gestation, chiefly happen to young women of a plethoric habit; and can only be obviated or palliated by a free use of the lancet, by gentle purging, cooling regimen, and low diet. After some evacuations in this way, if constant nauseating sickness *strongly* indicate a disordered stomach, a mild emetic may be of use; but it should be employed with the most judicious and guarded caution.

In opposite circumstances, a different treatment must be directed. Opiates, or castor and musk given internally, emollient glysters, warm fomentations applied to the legs, the semicupium, and every means to soothe nervous irritability and remove spasmodic

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stricture,

stricture, will then prove the most effectual remedies. When it cannot be received into or retained in the stomach, opium, in large quantities, should be exhibited by way of glyster.

When the patient is totally insensible and comatose, stimulating purgative glysters should be given; and epispastic and stimulating cataplasms, in order to rouse her, should be applied to the legs and hams. In desperate circumstances, the semicupium, or warm bath, should be frequently used, and long continued, with a view to relax and open the orificium uteri, and bring on labour.

In the intervals of the paroxysms, or after they have ceased, the patient, when languid or much reduced, must be supported by nourishing diet and suitable cordials; and, when she is no longer able to swallow, nourishment must be supplied by way of glyster.

2. In the advanced months, the attacks are more sudden, the progress more rapid, and the event more fatal, than in early gestation: therefore the most active and vigorous measures are necessary; for, like apoplexy, a fit or two then, in some instances, terminates the disease with the loss of life. If any treatment can prevent the threatening catastrophe, immediate and copious venesection, occasionally repeated, may chiefly be relied on.

Other means for lessening plethora, obviating the effects

effects of violent agitation, and rendering the system less irritable, must afterwards be employed, and the treatment otherwise directed according to particular circumstances.

3. Lastly. When convulsions come on along with labour-pains, they must be palliated by some of the means already directed, till the delivery can be safely assisted by art.

### S E C T I O N III.

*Some ordinary Diseases which require peculiar treatment when they occur during Pregnancy.*

**B**ESIDES those hitherto enumerated as more immediately deriving their origin from pregnancy, other disorders sometimes occur, which may then require some variety from the usual management. These are chiefly, paralysis, nephritis and calculi, herniae, dropsy, leucorrhœa, venereal complaints, fevers.

PARALYSIS is generally local, and chiefly confined to the lower extremities, or may be traced by the course of the nerves to depend on the pressure of the uterus. The treatment can only be directed with a view to palliate till delivery. Gentle exercise, moderate evacuations when the habit is full, otherwise strengthening diet and regimen, with warm applications and friction, are the principal remedies.

NEPHRITIS

**NEPHRITIS** and **CALCULI**. The former must be palliated by venesection, diluent drinks, opiates. If the calculus sticks in the urethra, and the woman is near her time, it should, if possible, be pushed back into the bladder with the catheter : otherwise, when easily come at, the stone may be cut upon and extracted.

**HERNIÆ**. Some of these are cured by pregnancy ; others continue during the whole term of gestation. Bandages can seldom be used with safety in the pregnant state ; at least tight pressure by the common umbilical bandage must be avoided. In time of labour, they must be carefully supported with the hand during a pain ; after delivery, future inflammation and its consequences must be guarded against ; the usual bandage must again be applied, when the patient is sufficiently recovered to be able to stay any time out of bed after delivery.

The **HYDROPS ASCITES**—in pregnant women, sometimes also occurs ; and will, during that state, only admit of palliation. The belly must be kept open ; the evacuation of urine, as much as possible, must be promoted, by cream of tartar, dried squills, and the like ; and gentle exercise must be used. If, however, the abdomen be much distended, the respiration difficult, and other symptoms urgent, the water may be safely drawn off by the operation of the paracentesis.

THE FLUOR ALBUS or LEUCORRHOEA—is sometimes cured, sometimes increased, by gestation. Except the little variety which an attention to the gravid state requires, the cure is the same as at other times.

GONORRHOEA and LUES VENEREA.— The cure of the former is to be conducted in pretty much the usual manner; that is, by keeping the parts clean by frequent bathing by drinking freely of diluent drinks, by an open belly and cooling diet. If complicated with ulcers and chancres within the labia, or any where about the vulva, the prudent use of mercury becomes requisite: It may either be given internally, or rubbed on the skin by way of uncti-  
on.

In the confirmed lues, we can only, in general, propose to stop the progress of the disease, or palliate the severity of the symptoms. But, in early pregnancy, when the constitution is good, and the season favourable, if a mercurial course be regulated with prudence, both mother and child may obtain a radical cure. The proper time for entering on such a course is between the third and six months. When a radical cure is attempted, the safest method of administering mercury seems to be in the way of uncti-  
on: As a palliative, the solution of corrosive sublimate is the most powerful preparation. To prevent diarrhoea and colic complaints, opiates always should, be conjoined.

FEVERS.—Women are less subject to febrile disorders during pregnancy than at other times. There is, however, an universal heat all over the body ; which with some is a symptom of conception, and with others continues during the whole term, that hardly deserves that name.

The limits of the present work neither admit of our entering into any disquisition on the nature of fever in general ; or the treatment of the variety of species. All great evacuations must then be avoided, and whatever might excite any violent shock to endanger abortion and its consequences. The treatment must otherwise be directed on the common principles, attending to the management necessary to be observed in circumstances so peculiarly critical.

#### S E C T I O N I V .

##### *Of Floodings and Abortion.*

**A**BORTION, and its common attendant FLOODING, are neither confined to the early nor latter months ; but happen indiscriminately to every period of gestation. The one is a frequent consequence of the other, and the event is often hazardous. In the earlier months, when the child has little life, a considerable discharge of blood frequently precedes the expulsion of the ovum ; and, in the latter stages, the effusion is sometimes so excessive as to endanger the mother's life.

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Their more frequent terms of occurrence are, in early gestation, the second and third, in advanced pregnancy, the fifth and seventh months.

### I. FLOODING.

The *Mænorrhagia Gravidarum* may be defined, “ A vague or irregular appearance of blood from the uterus, subject to no periodical returns, but liable to recur from very slight occasional causes.”

The immediate cause is, the separation of some portion of the substance of the placenta, or membrana decidua from the uterus.

The separation may be more remotely produced

1. By plethora.

a. General plethora of the whole system.

b. Partial plethora of the uterus and neighbouring parts, occasioned by

External accidents ; as,

Blows, cold, &c.

Internal causes ; as,

Tumors compressing some of the neighbouring arteries,

Effects of suppressed perspiration from the depressing passions, &c.

Effects of constipation, or the stoppage of any other necessary discharge.

2. Debility.

3. Direct affections of the uterus and placenta.

4. Stimuli communicated from an affection of other parts.

Floodings

Floodings seldom prove fatal to the mother before the seventh month of gestation, but are afterwards proportionally more alarming and dangerous. In the early months, there is always hazard of the loss of the foetus, even from an inconsiderable discharge; and from the increased diameter of the blood-vessels in the more advanced periods, the discharge is often fatal to the parent.

To check the hæmorrhagy, the indications are,

I. To diminish plethora, as well as the impetus of the heart and arteries.

II. To restore a more equable circulation in the whole system.

III. To restore the tone of the solids, and promote the constriction of the vessels.

1. To answer the first intention, venæsection, a free circulation of cool air, cooling diet, drink, and other refrigerants, are the principal remedies.

2. The second indication is with difficulty followed; for the exertion which the several remedies that produce this effect occasion, will be often very hurtful.

Vomiting and purging, except with the most cooling neutrals, are seldom admissible; and warmth, applied to the surface, is equivocal in its effects. The only means, therefore, which we can recommend with this view, is to keep the feet warm with flannels and gentle friction, and the body and mind  
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in the most perfect tranquillity. Opium, in the form of Dover's powder, is also frequently effectual in rendering the circulating more uniform and equable. Might not the opium and ipecacuan only, be kept mixed, and the powder given in those cases, in fresh solution of nitre, in a full dose? Such a formula would probably be a powerful remedy for hæmorrhagies of all kinds.

Some of the causes which we have mentioned are evidently beyond our reach. These indications are, however, chiefly useful in the early stages: the evacuation itself soon takes off plethora, as well as the hæmorrhagic effort of the heart and arteries; so that the chief business of the practitioner is,

3. To restore the tone of the solids, and promote the constriction of the vessels. With this view, internal astringents, and the application of cold, are the most effectual means. The styptics generally employed are, the vitriolic acid, alum, terra Japonica, and gum kino: but cold applications to the pudendum and neighbouring parts are chiefly to be trusted; as thick linen compresses wet with cold vinegar and water, applied to the os externum, pubes, and loins, and often renewed lest they should become warm. A bladder with cold water, in which some crude sal ammoniac is dissolved, may be used for a topical application, and will retain the cold fluid longer than any other compress.

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By thus keeping the patient quiet and cool, by giving internally cooling things and opiates, and by the application of cold to the organ affected, the hæmorrhagy may be restrained, tho' threatening and alarming; and the woman, after several attacks, may, under proper management, be enabled to carry the child to the full term of delivery.

Debility and relaxation must afterwards be removed, by nourishing diet and tonic remedies; and, in relaxed habits, the hazard of relapse guarded against by the use of the Peruvian bark, moderate exercise, and the other remedies usually employed after cases of profuse menorrhagia. In full habits, or where there is an evident disposition to plethora, gentle evacuations, cooling regimen, and an abstemious spare diet, are the best prophylactics.

In the latter end of pregnancy, when the hæmorrhagy proceeds from the separation of a portion of the cake which adhered at the cervix, over the orificium uteri, the deluge is sometimes so impetuous as to kill the mother very suddenly. The only method, then, in our power, for preserving both the parent and child, is by an *expeditious delivery*; I mean expeditious with respect to the time it is attempted, for the operation of delivery should be slowly performed.

In all cases of flooding, when any portion of the pappy substance of placenta can be felt by the finger

to present before the child, delivery should be performed as soon as the orifice of the womb is sufficiently relaxed to admit of the introduction of the hand, after gently stretching\*: and if the repetition of floodings without pain be frequent, or the discharge so profuse as to bring on faintings, it may be necessary to deliver, even though there should be no sensible dilatation of the uterine orifice, and though no part of the placenta can be felt to the touch; for, if the woman is previously much exhausted, she cannot be saved by delivery.

## II. ABORTION.

ABORTION is, "The premature delivery of the foetus;" which comprehends every period before the evolution of its system be sufficiently complete to enable the child to exist after the connection with the parent is dissolved.

Some authors still make the following distinction. When the ovum is expelled in the early months, they call it an *abortion*; and, if the foetus be delivered at any period between the fifth month and the full time, a *miscarriage*.

Abortion is commonly preceded by some of the following symptoms: Flooding, pains in the back or belly, uterine bearing-down pains with regular intermissions, the discharge of a watery fluid.

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\* See a valuable essay on this subject by Mr Rigby.

If, along with flooding, any portion of a vascular skinny substance, which is the *membrana dicidua*, should be discharged, abortion for certain will ensue. None of the other symptoms are infallible; even the evacuation of a watery fluid is not necessarily followed with delivery, since it may proceed from a collection on the outside of the ovum, between the lamellae of the membranes. In the early months excessive floodings sometimes occur; and yet, by proper management, the woman is often enabled to retain the child.

There is less fear of abortion while the blood evacuated is pure and without clots, unattended with uterine pain and pressure. But, in forming a judgment, the constitution, occasional cause, and term of gestation, must be regarded.

Abortions happen more frequently from the beginning of the second to the end of the third month, than at any other period.

The immediate cause of abortion is the same with that of real labour.

The more remote causes are,

- I. Whatever interrupts the regular circulation between the uterus and placenta; as,
  1. Diseases of the uterus.
  2. Imperviousness, or spasmodic constriction, of the extremities of the uterine blood-vessels.
  3. The separation of any portion of the cake, or decidua

decidua, from the uterus.

4. Determination of the fluids to other parts.

II. Every cause which prevents the distention of the uterus, or excites spasmodic contraction of its muscular fibres; as,

1. Extreme irritability, preventing the extension of that organ.

2. Violent exertions, as coughing, sneezing, vomiting, straining at stool: mechanical injuries, as strains, falls, &c.

3. Irritation from the confined motion of the foetus, its kicking or strugglings.

4. A habitual disposition to abortion.

III. The death of the foetus; which many be occasioned from,

1. Diseases peculiar to itself.

2. An original defect transmitted from the parents.

3. External accidents affecting the mother.

4. diseases of the placenta, membranes, or cord.

5. Too slight adhesion of the cake or membranes to the uterus.

6. Weakness, or want of resistance, in the texture of the membranes; or an excessive quantity of the liquor amnii.

7. Knotty circumvolutions of the umbilical cord.

The size of the abortive ovum in early gestation is as follows: Six weeks after conception, its bulk is

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nearly

nearly equal to a pigeon's egg; in eight weeks, to that of a hen; and in twelve to that of a goose.

Where there is no reason to dread abortion, every probable mean ought to be employed to relieve painful symptoms by rest and opiates, to check hæmorrhagy by the means already directed, and to obviate occasional causes as much as possible; and the woman should be encouraged to hope as long as there is grounds for it.

As abortion, in many instances, is preceded by no alarming symptom, till a discharge of watery fluid, or an excessive flooding, with clots and portions of the decidua, announce the approaching event; either to remove immediate symptoms, or prevent the accident that is dreaded, often baffles our boasted skill; for the circulation in the ovum perhaps had ceased a considerable time previous to any threatening symptom of its expulsion.

Little, therefore, can or ought to be done by way of treatment, besides obviating plethora, advising rest of body and tranquillity of mind, and guarding against every cause of irritation. Though the mother may suffer a considerable shock from miscarriage, and it may be some time before her constitution be sufficiently restored for any future fortunate pregnancy, women are rarely known to suffer fatally, but from mismanagement in the early months. Any manual operation to assist delivery, is seldom necessary  
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at an earlier period than the sixth month of gestation, unless the mother's life should be in danger from flooding. When this happens, the bag may be broken by thrusting the finger against it in time of pain, or endeavouring to assist its expulsion when within reach of the finger; but otherwise the delivery should be *wholly* trusted to nature. It is even hazardous to destroy the structure of the ovum in the early months: for when it breaks, the small foetus is first expelled; and the bag or placenta may be afterwards retained for a week or more, during which time the flooding often continues to be excessive; whereas, if the conception comes off entire, the effusion generally ceases immediately.

From long retention, the placenta, without circulation, is liable to become putrid: it is then expelled in different portions; and inflammation, excoriation, or gangrene of the uterus and vagina, often ensues. In these circumstances there is a necessity for keeping the parts clean, by frequent bathing, or by injections thrown into the vagina; and bark, with elixir of vitriol, should be given freely. Gently stimulating glysters, to promote the contraction of the uterus, in cases of retention of the placenta where there is no great flooding, are often useful.

As women who have once aborted are liable to a repetition of that accident from a similar or very trifling occasional cause, it ought to be guarded against  
by

by every possible means. With this view, the management during pregnancy should be properly regulated.

## SECTION V.

### *Management during Pregnancy.*

**T**HE regulations during pregnancy may be referred to the following rules.

1. The strictest temperance and regularity in diet, sleeping, exercise, and amusement, are necessary to be observed by those who have reason to dread abortions.

2. Overheating, irregular passions, and costiveness, should be constantly guarded against.

3. The hazard of shocks, from falls in walking or riding, from bruises in crowds, of frights from bustle, should be avoided with the utmost circumspection.

4. The dress of pregnant women ought to be loose and easy. Tight lacing is injurious at every period of gestation. In the early months, by preventing the uterus from rising out of the pelvis, it endangers miscarriage, and is still more hazardous in the advanced stages. Jumps, without knots, buckles, or whale-bone, secured with straps of broad tape or ribbon, should be had recourse to soon after conception, and worn constantly.

5. Preg-

5. Pregnant women require free, pure air; their inclinations should be gratified by every reasonable indulgence; and their spirits kept up by cheerful company and variety of objects, that their minds may be always composed and happy.

6. If complaints then occur, they should be treated nearly as at other times, with the precautions formerly suggested of avoiding all great evacuations and violent exertions. Drafftic purges, stimulating glysters, emetics towards the term of quickening, or any other critical period, strong diaphoretics or diuretics, shocks from electricity or the cold bath to those who have not been accustomed to them, the hazard of accidents from riding or sailing, and of the consequences of irritation from the action of blisters or the absorption of flies in particular circumstances and constitutions, ought to be carefully guarded against. In the early months, abortions might be readily occasioned from such hazardous expedients; and in the latter, the most alarming and dangerous floodings.

7. Lastly, With a view to prevent abortion in cases of habitual predisposition, in plethoric habits, or in those of an opposite temperament, occasional causes must be obviated, and the particular fault in the constitution corrected.

PART III.

LABOURS.

INTRODUCTION.

§ I. *General Observations.*

**W**HEN the uterus will admit of no greater distention, without a material, or probably fatal disorder, from its impeding the several functions, labour ensues.

At this period, the organization of the foetus is sufficiently evolved to enable it to continue its existence; for as it derives no injury from a longer delay, so it can survive a slight acceleration of this important change.

The period of gestation varies in the several classes of different animals. The mare, the cow, the ewe, and the goat, are restricted, each within its proper limits. In the human species, nine kalender months seem necessary for the perfection of the foetus; that is, nearly 39 weeks, or 273 days, from conception. The term does not, however, appear to be so arbitrarily established, but that Nature may transgress

gress her usual laws ; and, as many circumstances frequently concur to anticipate delivery, it certainly may in some instances be protracted. Individuals of the same class of quadrupeds, it is well known, vary in their periods of pregnancy. May we not from analogy, reasonably infer, that women sometimes exceed the more ordinary period? In several tolerably well attested cases, the birth appears to have been protracted several weeks beyond the common term of delivery. If the character of the woman be unexceptionable, a favourable report may be given for the mother, though the child should not be produced till nearly ten kalendar months after the absence or sudden death of her husband.

LABOUR is “ an effort of nature to expel the contents of the gravid uterus.” It is chiefly accomplished by the spasmodic contraction of the uterus itself. The diaphragm, muscles of the abdomen, and others concerned in respiration, and all the muscles of the body, are called in as auxiliary powers. These efforts alternate with intervals of ease ; and the exertions, or paroxysms, continue till the child is propelled, and the uterus completely emptied of its contents.

The *immediate cause of labour* seems to be, “ Irritation, from previous distention of the uterus, compressing the foetus and waters.” The uterine contents

tents being propelled against the orifice, the muscular structure of that organ will be stimulated into action, and labour-pains consequently ensue.

The *final cause* of labour is, the birth of the child.

*Spurious pains* frequently occur towards the latter end of gestation. Their causes are a slight degree of irritation of the uterus from excessive stretching; spasmodic affections of the abdominal viscera; or, any stimulus communicated from the intestinal canal, as colic from costiveness and other causes. They often nearly resemble labour, and ought to be carefully distinguished from it.

They are more vague and irregular, both in frequency and force, than those arising from genuine labour; they do not produce any sensible change on the orificium uteri; they are not attended with any considerable discharge of the rosy mucus, which sometimes precedes, and always accompanies, the first stage of real labour. They are generally confined to the lumbar region, or to the belly, without striking down the thighs; they are commonly most troublesome towards evening, occasion inquietude and restlessness in the night, and abate in the morning. They are further known to be spurious, by the relief procured from glysters and opiates.

*Genuine labour* is known to approach from the circumstances which usually precede it: the progress is marked

marked by the duration, force, and frequency of the pains ; by their effects on the general system ; more particularly by the dilatation of the uterine orifice, and protrusion of the water and child.

The *symptoms of approaching labour* are, the subsiding of the abdominal tumor at the superior part ; hence, at first, a relief from weight, pressure, and uneasiness formerly felt ; afterwards, a discharge ofropy mucus from the vagina, sometimes tinged or streaked with blood, commonly styled the *shews* ; then, slight pains of the belly or loins, frequent micturition, tenesmus, sometimes colic or diarrhoea, extreme restlessness, alternate rigours and hot fits.

The throes of labour usually commence with pain in the region of the loins, which spread round forwards and downwards, and again extend from the belly to the pubes, shooting down the thighs. At first they are vague, more slight and transitory ; but gradually increase in force, and recur at more regular intervals.

Sickness of the stomach, retching, and vomiting, alternate rigours and hot fits, in some instances accompany the earliest symptoms of labour ; in others, horripulatio occurs in the progress, and seems then to be occasioned by the pressure of the head of the foetus against the irritable uterine orifice.

Pyrexia, in young plethoric women, is a frequent attendant of labour ; for, with increased pain, the face becomes flushed, the pulse full, strong, and accelerated

celerated, along with dry parched mouth and fauces, and the other symptoms of fever, styled by authors *febris parturiens*. Ischuria, or suppression of urine, and sometimes an involuntary discharge of faeces, ensue.

The *progress of labour* generally proceeds in the following manner.

In consequence the great discharge of lubricating moisture, the genital parts are first relaxed, and then gradually begin to dilate. The membranes also gradually separate from the internal surface of the uterus; and, by its spasmodic contractions, the membranes and contained water is protruded in form of a soft, yielding bag, before the presenting part of the child. In the absence of the pain, the waters retreat; the membranous bag is relaxed, or flaccid; and the child, if within reach, can be distinctly felt through. When the pain recurs, the membranes become tense and turgid; spread out more and more; and, advancing lower and lower as the pains increase in force and frequency, they gently and safely stretch and dilate the the passages preparatory to delivery, in a manner which no human artifice can possibly imitate. When that important end is accomplished, the slender bag yielding to the propelling force, gives way, and the contained fluid is evacuated.

In a natural easy labour, the progress of the head of the foetus through the pelvis corresponds with the pro-

protrusion of the membranes and dilation of the soft parts. The head advances in a mechanical manner, its large axis being generally applied to that of the pelvis. When the vertex is nearly arrived at the lower circumference of the bony cavity, the membranes give way ; soon after which, the pains are renewed with increased force. The vertex advances through the axis of the vagina ; the occiput gradually emerges from under the arch of the pubes ; and the soft parts at the bottom of the pelvis beginning to be protruded in a form of a tumour, the os externum is gradually dilated. As the occiput rises from below the pubes, the face is turned towards the concavity of the sacrum ; the forehead presses against the moveable coccyx ; the vertex now protruding without the os externum and the stimulating exertions becoming so excessive as to throw the whole frame into the most violent agitation, the os externum is forced open, and the head of the child propelled. After some interval of ease, the pain, in a more moderate degree, recurs, and continues till the child is completely delivered, the shoulders making the same mechanical turns with the head.

When the woman has somewhat recovered the shock, the uterus again renews its contractions ; and by a more gentle and moderate exertion of the same power by which the membranes were separated and protruded and the child was propelled, the pla-

centa is detached from its adhesion to the womb, forced downwards to the orifice, and expelled.

This is the manner and progress of natural easy labour. But a variety of circumstances frequently concur to disappoint our hopes, and render the birth tedious and painful. The original position of the *fœtus in utero*; the bulk, shape and solidity of the head; the age, constitution, and previous condition, as well as present health and management of the patient; the action of the uterus itself, considered as a hollow muscle; the rigidity of the *os tincae*; the construction and capacity of the pelvis; the texture of the membranes; the tightness or constriction of the vagina; the resistance of the *os externum*, &c. occasion an astonishing variety in the degree of pain, the progress or duration, and manner of termination of labour. Practitioners should therefore be cautious of giving an opinion respecting the time of delivery, at least till the progress be considerably advanced.

A judgment of the duration and event of labour is chiefly to be derived from the force, continuance, and recurrence of pains; from the resistance of the *os tincae*, or the contrary; from the period when the membranous bag is ruptured; from the position of the child's head, and relative proportions that obtain between it and the pelvis.

Young women, apparently well proportioned of

a lax fibre and healthy constitution, may be presumed to have easy, favourable labours. We may expect the delivery to be tolerably easy and expeditious, when the pains come on regularly; when the child presents properly; when the membranes begin early to form a bag, and protrude the os tincae; when it is thin, soft, and yielding, and is felt by the touch to dilate sensibly by the force of the pains; when the head can be felt thro' the membranes during the remission of pain, advances progressively through the pelvis, preceded by the amnion tumor and the rupture of the membranes, when the head can be felt to press against the orificium uteri.

But, even in those circumstances, the progress of labour is often unexpectedly interrupted, by the remission or diminished force of pains for a considerable interval; by the constriction of the vagina after the os tincae is completely dilated; or, by the rigidity of the external parts, though no obstacle should occur from any defect in the construction of the pelvis.

In some instances, the progress is retarded by the early rupture of the membranes, slow dilatation of the os tincae, feebleness of the throes, and a variety of other causes. Nothing can therefore be more difficult, than to ascertain, or guess at, the time necessary to accomplish the wished-for event. The more ordinary limits of a natural easy labour are from six

to twelve hours; it is, however, sometimes completed within two hours, and sometimes requires several days. But the first labour is generally, from obvious causes, the most painful and tedious.

### § 2. Division of Labours.

THE ancients, as far as can be collected from their writings, divided labours into two kinds, Natural, and Preternatural. The first included head, or, according to some, head and breech, presentations; and all others were implied in the latter. Dead children seem to make a third distinction, and are directed to be delivered in a particular manner by sharp hooks.

In different authors we find different arrangements, and the classification is still arbitrary. That of Dr SMELLIE appears to be least liable to exception. He refers all labours to three general classes: 1<sup>st</sup>. Natural; 2<sup>dly</sup>, Laborious; and, 3<sup>dly</sup>, Preternatural. He calls those cases *natural*, where the head presents, and the child is expelled by the natural pains; *laborious*, when the head presents, but the birth is uncommonly protracted, or requires the interposition of art; and *preternatural*, when any other part but the head first presents, or when the feet are delivered before the head.

A great variety of divisions and subdivisions, however

ever, still prevail among modern practitioners; as, Natural and Non-natural, Slow and Linger- ing, Dif- ficult and Laborious, Preternatural, Wrong and cross Positions, Perilous, Mixed and complicated Labours, &c. ; and different explanations have been gi- ven by different authors to the same terms. Such indefi- nite distinctions serve to involve the subject in obscuri- ty, and to mislead and embarrass inexperienced prac- titioners.

All distinctions ought to be restricted to those cases merely which require a different mode of practice. With this view, labours may with propriety be re- ferred to Dr SMELLIE's general division of three classes; Natural, Laborious, and Preternatural : And each of these may be subdivided into two or more different classes; which also comprehend a conside- rably variety of particular cases.

I. NATURAL include,

1. Expeditious and easy,
2. Tedious and lingering, labours.

II. DIFFICULT or strictly laborious labours compre- hend,

1. Those cases where the HAND alone is sufficient to afford the necessary assistance.
2. Where INSTRUMENTS must be used.

III. PRETERNATURAL parturition comprehends,

1. Feet and breech cases.
2. Cross births.

3. One or both of the superior extremities protruded before the head.
4. All other cases that require the child to be turned; as floodings, prolapsed cord, &c.

§ 3. *Management of Labours.*

**I**N all labours, three distinct periods, or stages, may be marked.

1. The dilatation of the orificium uteri.
2. The delivery of the child.
3. The separation and expulsion of the placenta and secundines.

Of these the first is by much the most tedious, and the management is nearly the same in all labours; for, whatever time may be necessary to accomplish it, this first stage should, in every instance, be trusted to nature; dangerous floodings, (very rarely local defects in the soft parts) only excepted.

The third stage seldom requires much assistance from art.

In the second stage chiefly, a variety of management in different circumstances becomes necessary.

We shall first give a few directions for the treatment of Natural Labour in its three several stages; and then concisely direct the variety of management in the particular Cases of the other Classes.

## C H A P. I.

*Method of Treating* NATURAL LABOURS.

## SECTION I.

*Expeditious and Easy Labours.*

## FIRST STAGE.

DILATATION *of the* ORIFICIUM UTERI.

ON the commencement of labour, and previous to any attempt to assist it, the necessary apparatus should be prepared. The room should be lofty, the bed equally distant from a confined situation, and a current of air; the curtains, and every part of the furniture, should be thin and incapable of retaining either moisture or smell. The coverings of the sheets should be carefully adapted to prevent the blood or the waters, from penetrating through them.

The patient should be permitted to walk, or rest in her usual postures, till the os uteri is dilated, and the pains be frequent and pressing: she should then be placed on her side, with her knees drawn up; and, in advanced labour, they may be separated by

a pillow, and a resistance given to the feet by an assistant. Before she is placed in this position, every indelicacy, by frequent touching, is highly improper. It is afterwards more essential, and should never be neglected immediately after the rupture of the membranes; for the child's arm, or any portion of the umbilical cord which may threaten to present, may then be replaced with ease.

Having obviated every cause which may impede labour, and guarded against every thing which may disturb or irritate the patient, we should wait with patience till nature has protruded the head of the child, or the membranes filled with their fluid. If we interpose before, it should only be to apply a warm cloth to the os externum, or a pressure to the loins, if the pains are violent.

The first stage of labour is then accomplished.

## SECOND STAGE.

### DELIVERY *of the* CHILD.

**I**F the membranes have not been before ruptured, it should now be done by the finger of the Accoucheur; and a remission of pain generally ensues. It returns, however, as soon as the watery fluid is discharged; and the perinaeum is soon after distended by the pressure of the vertex: but, under proper management,

management, no bad consequences follow from the distention, unless the labour is rapid or tedious. In the former case, the parts of the mother have been lacerated; and, in the latter, violently inflamed, in consequence of the long-continued pressure of the child's head.

When the parts are violently stretched, the perinaeum may be gently supported during a pain, and a counter-pressure is generally recommended when the labour is rapid; but it should be remembered, that this support is only useful as it retards the labour, which is often inconvenient, and sometimes dangerous. A laceration of the perinaeum is a very rare occurrence, and generally the consequence of previous disease. It is therefore doubtful, how far a hazardous expedient is to be recommended to obviate an uncertain accident.

After the head is delivered, there is seldom any danger: the shoulders accommodate themselves to the passage; and the birth may then be safely facilitated by the hands of the Operator, if any assistance should happen to be necessary.

The child should be immediately removed, as far as the cord will permit; if it is twisted about the neck, body, or limbs, it must be disengaged, and, after the child has shown signs of life, the cord must be tied. If the child has suffered from the compression of the head, the string may be safely suffered to bleed

bleed a little, or, if it appears to have been lately dead, the usual stimuli should be employed \*.

### THIRD STAGE; OR

#### *Separation and expulsion of the PLACENTA and SECUNDINES.*

#### *MANAGEMENT OF THE PLACENTA.*

**H**AVING given the child to the nurse or one of the attendants, the next object of our regard is, the Management of the Placenta.

The same powers which expel the foetus, are again, after a short interval, renewed, but in a lesser degree, to exlude the secundines. Their structure is, however, different from the more solid mass of the foetus. The uterus sometimes contracts unequally; the os tincae is more irritable than the fundus; and the muscular fibres round the edge of the orifice sometimes contract so quickly, that the aperture soon diminishes, and may for a little time prevent the cake from passing after its adhesion to the uterus is dissolved. From the unequal or partial contraction of the muscular fibres of the uterus where the placenta

\* For a more minute detail of the apparatus of the bed, dress of the patient, and other particulars relating to the Management of Natural Labours, see *Treatise of Midwifery for the use of Female Practitioners.*

centa is attached, one portion may be separated before another: all which render a variety of management, in peculiar circumstances, necessary.

Hence the opposition of sentiment of authors on the subject; some recommending as a general rule, to precipitate the extraction immediately after the delivery of the child, lest the uterus suddenly closing, should render the operation difficult and hazardous; while others advise, in all cases, to trust the management entirely to nature.

The middle course is, in general, the most safe and proper; and both extremes should be equally guarded against.

As the separation is accomplished by the spontaneous contraction of the uterus, more or less time will be necessary, according to the previous state of gestation, duration and management of the preceding part of labour, condition of the woman immediately after, and a variety of other occasional causes which may impede or promote the action of the uterus.

In most cases, the adhesion is dissolved within half or three-fourths of an hour after the birth of the child. The contraction of the uterus is most expeditious, and of consequence the placenta most easily and quickly separated, after a first pregnancy, when the woman is in good health, and when the labour has been properly managed. The contraction of the uterus is more slow and imperfect, and consequently the  
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the adhesion of the cake more tenacious, in premature births, when the woman's health is impaired from previous indisposition; in cases of tedious and difficult labours,—of languor or faintness after delivery,—and when hasty attempts have been officiously employed to force the extraction.

The diminished bulk, and shifting of the abdominal tumor, which may be felt by the application of the hand externally, afford the best means of information *when* to attempt expediting the expulsion of the secundines; and, in general, enable us to judge whether any other child be retained *in utero*.

The approach of the birth of the placenta is commonly announced by the discharge of some clotted blood, and by a slight degree of uterine nifus, called by the women *grinding* or *gripping pains*. Then is the time to assist the expulsion; which ought to be performed in this manner.

The cord must be twisted round the fingers of the left-hand, so that a firm hold is obtained; two fingers and the thumb of the right-hand should also be applied, to grasp the cord within the vagina. The advantage of a pain, when it occurs, should always be taken. The cord must be pulled from side to side, and backwards towards the perinæum, endeavouring to drag in such a direction as to bring the central part of the cake through the axis of the uterus and pelvis, and desiring the woman to employ her own exertions

exertions moderately by bringing a deep inspiration and bearing down gently; but, violent efforts of coughing, retching, sneezing, or straining, should be constantly avoided, lest dangerous floodings or deliquia might follow. It is known to advance, by the lengthening of the cord, and the straining of the woman. When the bulky part of the mass arrives at the os tincae, the inverted cake, pressing against the orifice in a globular form, sometimes gives considerable resistance. This obstacle may be removed, either by passing up two fingers of the right-hand, guided by the cord, to bring down the edge; or by waiting a few minutes, then pulling gently at the cord with the left-hand, and pressing on the substance of the cake with the fingers of the right, higher and higher till the edge can be brought down, which must be grasped firmly, the funis being still extended with the other hand. The whole substance of the cake, with the membranes, being at last entirely disengaged, are to be gradually extracted, put into a basin, and removed.

But, if the placenta does not advance when the cord is fully extended, and the woman suffers considerable pain, the operator must immediately desist; lest, by carrying the attempt further, floodings might be occasioned, the cord be ruptured, or the uterus inverted. A soft warm cloth should then be applied to the os externum, and the patient allowed to rest  
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for five minutes. If it does not yet advance, ten or fifteen minutes more should be waited for; and, in the interval, a moderate degree of pressure on the abdomen, in different directions, may promote the contraction of the uterus, and assist the separation. By gradually proceeding in this manner, and patiently waiting for the contraction of the uterus, the placenta will be produced so low, that the centre can be felt, the edge brought down, and the extraction safely accomplished.

The *introduction of the hand* into the uterus to separate the adhesion, or assist the expulsion of the after-birth, is not perhaps absolutely necessary in one of several hundred cases. However cautiously performed, it occasions a considerable degree of pain; the very apprehension of an expedient so harsh and unnatural, inspires the utmost dread and horror, and not unfrequently causes deliquia or fits. It is cruel and barbarous to employ a painful mode of assistance, it is criminal to hazard the consequence of violence, where the same end may be obtained by gentle means, perhaps by waiting an hour or two extraordinary. In every view, the operation of introducing the hand to remove the placenta should only be employed in the most urgent cases.

It must, however, be acknowledged, that the placenta cannot always be removed by pulling at the cord. It may be ruptured: A profuse flooding indicates

dicates the necessity of the immediate interposition of the artist; for while he deliberates, the patient may sink: the uterus may be spasmodically constricted over or upon the cake, and prevent its advancing: or, The cake may be retained from extraordinary or morbid adhesion to the uterus. We shall consider each of these cases separately.

*I. Method of removing the Placenta when the Cord is ruptured.*

THE cord may be torn by the carelessness of the operator, from its feebleness in premature births, or from its putrid state when the child has been some time dead. In the last cases, the rope is never to be trusted. Time should be given for the cakes to be disengaged and forced downwards; and the cord should only be used for a guide, to conduct the fingers to press on the placental mass, in the manner directed, when it is advanced as far as the os tincae.

When there is no rope for a direction to the hand, and it appears necessary to remove the placenta on account of the apprehension or anxiety of the woman, or any threatening symptom of danger, the hand must be gently insinuated into the uterus, and the ragged membranes round the edge of the placenta searched for. If it cannot be disengaged by bringing down the edge, let the hand be conveyed to the thick

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protruded

protruded centre; and by spreading out the fingers, then bringing them together so as to grasp the cake in the palm of the hand, and repeating the attempt again and again, the stimulus of the hand will promote the contraction of the uterus. The cake being at length entirely detached, is to be cautiously and gradually brought down, and removed.

*2. Method of extracting the Placenta in Cases of Flooding.*

A PROFUSE haemorrhagy supervening the delivery of the child, is alarming and dangerous; if it does not soon cease, fatal syncope will probably ensue. Though it seem to abate, if the woman be low and faint, the relief may be fallacious; and is perhaps occasioned by part of the placenta forced down at the cervix uteri, and by plugging up the orifice prevents the effusion externally.

The consequences to be dreaded can only be prevented by removing the placenta; for, while one portion adheres and another is detached, there is little chance that the flooding will stop till the uterus be put into a condition for contracting. The hand of the operator is to be gradually, but with a certain degree of courage and resolution, introduced into the uterus, taking the navelstring for a guide, and gathering the fingers together in a conical manner. If the placenta seems attached to the opposite side, the  
hand

hand already introduced must be withdrawn, and the other passed in its stead; or if, from its adhesion towards the upper part of the womb, it appears to be without the reach of the hand, the position of the woman must be altered, and she must be shifted from one side to the other, from the side to the back, cross the bed, or placed on her knees and elbows, according to the particular circumstances of the case.

The placenta, by its firmness, can be readily distinguished from loose clots of blood; and, from the womb, by its softness and want of feeling. It may be disengaged by insinuating the fingers between it and the womb, through the membranes, when the separated edge of the cake can easily be come at. If it cannot, the thick middle part of the placentary mass should be grasped firmly, spreading out the fingers and gathering them together upon it, and in that manner gradually endeavouring to disengage and bring it away. It is dangerous to strip or peel it from the womb, by placing the fingers on the outside of the membranes, as authors generally advise; for, by that means, where the womb has lost its contractile power, a fatal deluge may be occasioned.

### 3. *Management of the Placenta in Cases of Spasmodic Contraction of the Uterus.*

LITTLE hazard is to be dreaded from this cause of retention; as by waiting for some time, perhaps several

veral hours or longer, the spasm will be removed, the equal contraction of the uterus restored, and the placenta by the successful efforts of nature disengaged and expelled.

Though it might perhaps be the safest practice, both in this case and when the cord is torn, to delay the interposition of manual assistance even for a day or two, when the cake will probably be expelled in time of sleep, soon after waking, or forced off during the effort of passing urine; *yet there is always hazard of leaving the woman before the after-birth is delivered.* She may suffer from anxiety and agitation; or a flooding from partial separation may ensue, and life itself be quickly extinguished.

If the operator cannot stay constantly with the patient, nor any assistant be procured, the best practice is to give a full dose of opium, as 40 or 50 gtt<sup>s</sup> L. L.; and when she is composed, and begins to be drowsy, if the cake cannot be brought away by pulling at the cord, and uterine efforts are in vain waited for, the hand of the operator may then be introduced into the uterus in a conical manner, and the constriction gently and gradually be overcome. The cake will probably be found mostly loose and disengaged, which must be firmly grasped in the hand and removed.

4. *Management in Cases of morbid Adhesion of the Cake.*

THE placenta is liable to become diseased. It sometimes partially or wholly degenerates into hydatides, becomes scirrhus, cartilaginous, more rarely bony. Either of these states is probably originally preceded with some degree of inflammation; in consequence of which the intermediate connecting membrane between the cake and the uterus is destroyed, and a coalition formed between them.

Of all the causes of retention, this is the most difficult and dangerous. The case is intricate and perplexing. If the placenta remains, and nature fails to expel it, the woman generally dies from uterine inflammation and gangrene. She is often also the unhappy victim of the unsuccessful attempt of the operator: for the uterus has been torn by the officious or unskilful efforts of the practitioner; or mortal floodings, inflammation, or gangrene have ensued.

If, in these circumstances, we should wait for the natural expulsion, the woman may be quickly destroyed by flooding, from partial separation. If we attempt to force a separation of the adhesion, by tearing the placenta from the uterus with the fingers while that organ is in a state of atony, a fatal deluge from the destruction of vascular substance may ensue before the hand could be withdrawn from the uterus.

The best and safest practice, in these alarming cases, is to defer our attempts as long as possible: then, but before the putrid process commences, to insinuate the hand with the utmost caution and tenderness; attentively examine the cake, by feeling every part of its substance; carefully avoid tearing by force at that place where the diseased hardness or scirrhus is; separate cautiously that portion which is loose and soft and which yields to gentle efforts: the rest must be left to nature; to be expelled with the cleansings, or destroyed and discharged by means of suppuration.

Upon the whole, it is hazardous to precipitate the delivery of the placenta, or to trust in alarming or difficult cases the imperfect efforts or *limited powers of nature*. From over hasty or violent attempts to force the extraction, the most dreadful accidents, as inflammation, laceration, or inversions of the uterus, and mortal haemorrhagies, frequently happen. From the retention of the secundines, malignant, putrid, or miliary fevers, and fatal floodings, have often also been occasioned\*; of which I have known several instances.

\* *Vide* Mr White's valuable treatise, Directions for Managing the Placenta, particularly Cases 11th, 12th, 13th, 14th and 15th; and Mr Kirkland's Treatise of Child-bed Fevers, particularly p. 158—164.

## SECTION II.

*Tedious and Lingerin<sup>g</sup> Labour.*

**A** LABOUR, though strictly natural, with respect to the position of the child, the management, and termination, may be tedious and lingering in the progress or duration of its different stages. This is exceedingly distressing to the patient, perplexing and vexatious to the practitioner.

When the labour is protracted beyond the more usual limits the woman becomes anxious and dejected; the pains occasionally remit and recur with frequency and violence, or alternate with imperfect and irregular intervals of ease; the progress is slow and imperceptible; her spirits are exhausted from restlessness and apprehension, or while the pains abate she insensibly falls into short but unrefreshing slumbers. After a long and obstinate conflict, by the reiterated succession of feeble efforts, the head of the foetus moulds itself to the passage; the crannial bones are compressed; the vertex lengthens out, forming a soft conical tumor; the resisting yield to the propelling powers: and the birth, after perhaps a period of two or three complete days, is at last, however, safely accomplished.

The causes of lingering labour may be referred to the following.

I. In the MOTHER.

1. Any defect, more immediately in the action of the uterus, or auxiliary powers of parturition, which impedes the force of the labour pains.
2. More remotely; universal debility, from
  - a. Flooding, diarrhœa, or other debilitating evacuations.
  - b. Epileptic fits.
  - c. Crampish spasms.
  - d. Sicknefs, lownefs and faintnefs.
  - e. Fever, from inflammatory diathesis, or improper management.
  - f. Sudden or violent emotions of the mind.
3. Local impediments interrupting the passage of of the child ; as,
  1. In the bones affecting the dimensions of the pelvis.
  2. In the softparts ; as,
    - a. Constriction or rigidity of the os tincae.
    - b. \_\_\_\_\_ of the vagina and os externum.
    - c. Scirrhus or polypous tumors.
    - d. Tumefaction from hardened faeces in the rectum.

e. Stone in the urethra.

f. Distention of the bladder from urine.

g. Prolapsus of the uterus, vagina, or rectum.

II. In the CHILD ; as,

1. The bulk and unusually complete ossification of the head ; or,

2. Its unfavourable position.

3. The bulk or improper descent of the shoulders.

III. From the SECUNDINES and WATER ; as,

1. The rigidity or weakness of the membranes.

2. An excess or deficiency of the liquor amnii.

3. The length or shortness of the cord.

4. The improper attachment of the placenta.

As these causes exist singly or combined, the labour will be less or more difficult and painful.

Most of the obstacles now mentioned are to be surmounted by patience and perseverance. If the labour is otherwise natural, though from peculiarity of habit and a variety of particular circumstances it should prove tedious, the safest and best practice, in general, both for mother and child, is to trust the management *wholly to nature*.

The difficulty is frequently owing merely to the resistance of the soft parts ; hence strong robust women suffer more than the nervous and delicate. In the former

former, the parts are tense and rigid, and stretch slowly. In the latter, they are more relaxed, soft, and yielding. The first require the cooling, sedative plan; the latter, light nourishing food, in small quantities, often repeated, with the moderate use of cordials and anodynes. In either case, tranquillity should be promoted, by keeping the patient quiet and easy; by constantly avoiding fatigue, bustle, and noise; at the same time soothing and comforting her with the best assurance of a happy delivery.

We shall concisely treat of these several causes.

### I. In the MOTHER.

1. Any defect in the action of the uterus itself considered as a muscular organ, or of the auxiliary Powers of parturition, impairs the force of the labour-throes; or, in other words, renders the pains feeble and trifling.

The over-distention of the uterus impairs the action of its muscular fibres, and may for some time prevent those spasmodic efforts by which the os tincæ is opened and the foetus expelled; there may be also other causes of torpor, or want of irritability, of which we are ignorant. Excessive distention of the uterine fibres can only, however, have a temporary effect to retard the labour; and it is little in our power to obviate the defect, till the membranes can be ruptured and the water evacuated: the uterus then

then coming in close contact with the body of the fœtus, the head will begin to press against the orifice, and the pains become strong and forcing.

But, as many inconveniences are known to ensue from an early discharge of the waters, that expedient should be the result of the most cautious and deliberate reflection; and should never be had recourse to till the orifice be sufficiently dilated. Any defect in the auxiliary powers will produce the same effect in a lesser degree: For, since the whole system of muscular parts is employed in the action of parturition, in proportion as any of these are impaired or weakened, the exertions of labour will be less strong or forcing. But particularly, whatever affects the diaphragm and muscles concerned in respiration, will materially impede or interrupt the action of parturition. A narrow chest, difficult respiration from whatever cause, hydrops ascites, &c. have a considerable influence on delivery.

The treatment of all these variety of cases must be directed with a view to remove, or obviate the causes of interruption as much as possible.

2. More remotely, the progress of labour may be interrupted by debility, from

a. FLOODING.—Though flooding, in advanced gestation, is always alarming and dangerous, it is  
less

less hazardous when it occurs along with labour-pains: for by proper management the hæmorrhagy may generally be checked, till the pains become strong and regular; it afterwards usually stops or abates, and the delivery terminates favourably. But, if the flooding proceeds from the attachment of the placenta at the cervix or over the orificium uteri, which can readily be known by a careful examination from touching, the case is highly alarming, the danger imminent, and the event to be dreaded can only be prevented by an expeditious delivery.

*Diarrhæa*—when excessive, exhausts the patient, brings on debility, and diminishes the force of the labour pains. Warm-water glysters to wash out the rectum, and opiates, are the best palliative remedies. The strength must be kept up by proper nourishment; as beef-tea with rice, hartshorn gellies, &c. and the moderate use of cordials.

*b. EPILEPTIC FITS*—when so violent or frequently repeated as to leave the patient in a state of stupor and insensibility, retard labour, and endanger the lives of both parent and child. If the fœtus should not be expelled by a few paroxysms,—if symptoms are threatening, and the child is within reach of the forceps, delivery should be effected as soon as possible. But any violent exertions to procure delivery, by forcibly stretching the parts, and counteracting nature,  
with

with a view to turn the child, as many advise, is impracticable with any probability of success. In every instance it ought to be a rule, to wait till the head of the foetus is sufficiently protruded, that the access may be easy to apply the forceps.

*c.* CRAMPISH SPASMS— are generally confined to the thighs and legs, more rarely the belly is affected. They proceed from the pressure of the child's head on the nerves as it advances through the pelvis, and can only be removed by delivery. But as the pains are seldom attended with danger, few cases occur to render the assistance of art necessary, except by breaking the membranes, which often relieves the pains when excessive. Venaesection, glysters, and opiates, may be occasionally employed as palliatives, when the belly is the seat of the disease.

*d.* SICKNESS, LOWNESS, AND FAINTNESS—often occur, and have also a considerable influence in retarding the termination of labour. They happen chiefly to women of weak nerves, or others whose health has been impaired from previous sickness or mismanagement; and accompany the first part of labour only. In its progress, the woman acquires fresh vigour and additional resolution; the pains become strong and forcing; the delivery, even where the patient appears to be weak and exhausted, often

has a safe termination, though several days should be necessary to accomplish it ; and the recovery is as favourable as if the whole management had been regulated by the wishes of the attendants\*.

In cases of lowness and depression, the great object to be aimed at is to gain time, to support the patient's strength and spirits ; to guard against putting her on labour too early, and to use every means for reserving her strength and resolution. When the pains are slow and trifling, when she is restless, anxious, and dejected, opiates often produce the happiest effects ; they remove grinding fruitless pains, recruit the spirits, and amuse the patient during the tedious and painful time. We can scarcely aim at more ; for, though the dilatation of the uterus, and progressive steps of the labour, advance by slow degrees, under proper management, and while no alarming symptoms occur, no danger from delay is ever to be dreaded.

*e.* FEVER, from *inflammatory Diathesis, or improper Management.*—Inflammatory diathesis in young subjects of strong rigid fibres and plethoric habits, must be obviated by venesection, repeated glysters, and

\* I have attended a patient three days and nights, and one whole fourth day, without danger : the woman crooked, and the child large. She lived all the time on tea and gruel only. *Dr Hunter's MS. Lectures on the Gravid Uterus, article Difficult Labours.*

and cooling regimen. The management must be otherwise regulated by particular circumstances.

*f.* EMOTIONS of the MIND. Every kind of information or intelligence in which the patient, her family or relations, are nearly interested, should be carefully concealed. Their effects in disturbing the woman, occasioning flutter, agitation, and their consequences, are too well known to require any further cautions concerning them.

3. Local impediments interrupting the passage of the child ; as,

(1.) *In the Bones, affecting the Dimensions of the Pelvis.*—Narrowness from distortion of the bones can readily be discovered when the defect is confined to the outlet. But when the brim is faulty, and the woman in other respects tolerably well proportioned, we can only judge from the effects.

If the progress of the labour be slow and tedious—if, from the general figure and construction of the woman's body, there should be reason to suspect a faulty pelvis ;—if the spine be twisted, the legs crooked, the breast bone raised, or the chest narrow ;—such constitutions, independent of any defect in the basin, require a particular management ; they cannot suffer much confinement to bed, on account of their breathing ; nor give much assistance to the pain by their own exertions.

Distortions

Distortions of the brim are more difficult to discover; but we can distinctly feel any material defect in the shape of the sacrum and coccyx, in the position of the ischia or distance between them, and any deviation on the arch of the pubes. Where the distortion is so general that the whole cavity of the pelvis is affected, the shape of the body, the slow progress of the labour, and the state of the parts to the touch, afford sufficient information. In either case, after the first stage of labour, narrowness of the pelvis can be known from the symptoms; though it is difficult, and almost impossible, to ascertain the degree of deviation with mathematical accuracy. The hand cannot be introduced while the passage is obstructed with the head of the foetus; the pelvimeter of Monsieur COUTOULY, or graduated probe recommended by others for measuring the pelvis, are less to be trusted\*. In one word, we are to judge of the narrowness, from the fruitless efforts of coercive throes after the uterus is sufficiently dilated, — from the head of the foetus advancing in a conical form, with the cranial bones overlapped, giving a sharp feel to the touch like a sow's back †; and of the degree of distortion by practical knowledge.

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\* See the method of examination by the fingers and hand to detect narrow pelvis, as directed by Dr Wallace Johnston, *System of Midwifery*, 4to, p. 288, to p. 291.

† See Dr Smellie's Tables, Pl xxvii. & xxviii.

A slight diminution of capacity will be overcome by the gradual compression of the bones of the cranium: but, if the distortion be considerable, the child's head large, or unusually well ossified, and remains obstinately wedged in the pelvis; if the woman's strength is impaired, along with swelling of the parts, suppression of urine, &c. in these circumstances it would be dangerous to delay the proper means of affording assistance, as both mother and child might become the victims of neglect or mismanagement. We should be aware, however, of being imposed on, either from the anxiety of the distressed patient, or by the noisy clamours of impertinent attendants. It must be remembered, that the gentlest assistance our hands, or instruments, in laborious births can procure, is always attended with some degree of hazard: that if instruments be employed too early, that is, improperly, nature will be interrupted; and, from the bruises by the force of pulling, from the resistance to the mechanical power applied, or from the instrument losing its hold, the most fatal consequences may ensue.—On the contrary, if artificial assistance be too long deferred, the strength of the patient being exhausted, she may die undelivered; sink during the operation, or soon after. But, mechanical exertions to force delivery, where in time nature unassisted might accomplish the task, has, in fact, proved

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more

more fatal than the latter. To draw the line of distinction between Lingering and strictly Laborious Labour, is exceedingly difficult, or to determine the critical time of interference. It is, however, an object highly interesting:—the honour of the profession,—the credit of the practitioner,—the important lives of a worthy mother and her progeny, depend on it; and the Accoucheur is culpable for his neglect or misconduct.

( 2. ) *In the soft Parts; as,*

a. *Constriction or Rigidity of the cervix or Orificium Uteri.*—This is one of the most common causes of lingering labours; it chiefly occurs in elderly women, in strong robust constitutions, or where the intervals between child-bearing have been distant. If the orificium uteri, instead of kindly opening with the pains, and becoming thin, soft, and dilatable, should form a thick ring or flap, stretch slowly, and the pains are frequent, but unprofitable, a tedious labour may be expected. Warm glysters, injections of warm oil into the vagina, and the vapours of warm water, after the waters have passed, are the only means of relief; for it is difficult and dangerous to stretch the mouth of the womb with the fingers. But, though the labour be lingering, if we have only patience to wait on nature, we shall generally find her efforts sufficient: for, in a first labour, or when the

the woman is advanced in life, and the parts are dry and rigid, from 36 hours till three days may be required for the dilatation of the orifice of the womb; yet if the management be properly regulated, neither the mother nor the child will be in danger, and the mother's recovery will perhaps go on as favourably as if the delivery had been accomplished in a few hours.

b. *Constriction or Rigidity of the Vagina and Os Externum.*—The disadvantage of these contractions in the soft parts chiefly is, that the head of the child is detained for some time from advancing without the os externum, after it has passed through the bony cavity. But the child seldom suffers; and, when in hazard, can seldom be saved without injuring the mother. Warm fomentations to soften the parts, not to heat the body, may in these cases be used, and oil or pomatum be applied: but it is of the greatest consequence that the parts should stretch slowly; so that we ought not to hasten the stretching by any manual application.

c. *Scirrhus or Polypous Tumors.*—There is seldom occasion, in case of cicatrices about the os tincae or vagina, to dilate with the scalpel, to remove polypous tumors by excision, or to cut upon and extract a stone from the urethra in time of labour. But if  
circum-

circumstances are urgent, such expedients are safe and practicable, and warranted by many precedents.

From previous ulceration, or laceration of the os uteri and vagina, disagreeable constrictions happen: but they are frequently overcome in time of labour. There are many well attested instances, where, at the commencement of labour, it was utterly impossible to pass a finger within the contracted orifice of the vagina; yet the parts dilated as labour increased, and the delivery terminated happily. In some cases, the dilatation begins during pregnancy, and is completed in time of labour.

d. *Tumefaction from hardened faeces*—frequently proves an obstacle to labour; for the contents of the gut form a large tumor, which can be readily felt from the vagina, and diminishes its cavity. This tumor has been sometimes mistaken for the child's head; but the mistake is soon discovered by a skilful practitioner, for it is removed by frequent glysters.

e. *Stone in the Urethra*.—In those women subject to gravelish complaints, a bit of stone thrust forwards by the force of labour, from the neck of the bladder into the urinary passage, will occasion difficulty, pain or suppression of urine: and may, if not removed, prove an insurmountable obstacle to the progress of labour. If it cannot be easily pushed back by introducing

ducing the catheter, a surgical operation must be had recourse to.

f. *Distention of the Bladder with Urine*—in slow labours, frequently occurs, and is a dangerous circumstance. It should be early guarded against by abstinence from drink; and removed by evacuating the urine, gently pressing back the child's head with the fingers when the introduction of the catheter is difficult.

g. *Prolapsus of the Uterus, Vagina, and Rectum*.—In a pelvis too wide in its dimensions, the *womb* at full time may descend into the vagina by the force of the throes of labour; though such cases very rarely occur. The only treatment is to support the womb well by pressure with the hand in time of the pain, that the stretching of the parts may be gradual.

The *vagina*, in weakly women, often prolapses in time of labour, and is protruded before the child's head by the force of the pains. If this happens, it must be replaced in the absence of the pain, by gentle pressure with the fingers, introduced in a proper manner and direction, and its return afterwards prevented.

*Prolapsus of the Gut*—must be treated in a similar manner; its protrusion may be prevented by pressure with a thick linen compress applied over the anus,

nus, and retained with the hand in time of the pain.

II. In the CHILD, the labour may be protracted from,

I. *The Bulk and Ossification of the Head.*—There may be either a natural disproportion between the head and body, or the swelling may be occasioned from a collection of water in the head, or be the consequence of the child's death.

From the structure and make of the pelvis and head in a natural state, it is evident, that a head of a larger size, having the bones soft and moveable, will pass through the pelvis with less difficulty, and occasion less pain in the birth, than a smaller head, having the bones more solid, and the sutures more firmly connected. A large head may be suspected when the vertex does not lengthen out by the force of the pains (as it commonly does in lingering labours); when the progress of the labour is suspended, though the pains continue to be strong and frequent, after the soft parts are sufficiently dilated; when the woman is in good health, and there is no other apparent cause to account for the protraction.

When the swelling proceeds from a collection of water in the child's head, it may be known by the head presenting at the brim of the pelvis in a round bulky form, by the distance between the bones of the  
head,

head, and by a softness and fluctuation evident to the touch.

When the child has been long dead, the head and body often swell to a great size. This may be known from the history of the case; from a particular puffy feel of the presenting part of the child; from the discharge of putrid waters, sometimes mixed with the meconium of the child; and from the separation or peeling of the outer skin of the head when touched: Though it may be here observed, that the most probable or suspicious symptoms of the child's death are often deceitful.

From whatever cause the head is enlarged, if the difficulty arises from that circumstance, and the force of the pains proves insufficient to push it forwards; if it has made no sensible progress for several hours after the waters were discharged, and the os uteri is fully dilated; and if the pains should begin to remit or slacken, and the woman to be low, weak, or dejected; it will then be necessary to have recourse to the assistance of art.

(2.) *The unfavourable Position of the head.*—The head of the child may be squeezed into the pelvis in such a manner as not to admit of that compression necessary for its passing through the bony cavity.

Where the pelvis is well formed, and the head of an ordinary size, although it should present in the most awkward and unfavourable position, it will yet advance;

advance; and nature, under proper management, will, in most cases, safely accomplish the delivery. The labour will unavoidably be more painful and laborious; but, whatever time may be required, there is less hazard either of the mother or child, than if delivery had been hastened by the intrusion of officious art.

But if the woman be weak or exhausted, and the pains trifling; if the head of the child be large, the bones firm, and the sutures closely connected; or if there be any degree of narrowness in the pelvis; a difficult labour may be expected, and the life of both mother and child will depend on a well-timed and skilful application of the surgeon's hands.

The unfavourable position of the head may be referred to two kinds, which include a considerable variety.

- 1st, *When the Crown instead of the Vertex presents.*
- 2dly, *Face-Cases.*

First, *When the Fontanella, or Open of the Head, instead of the Vertex, first presents to the touch, a more painful or tedious labour may be expected: for the head does not take the same mechanical turns in passing through the pelvis as in natural labour; the face either originally presents to the pubes, or takes that direction in passing. The bulky crown is forced within the brim of the pelvis with more difficulty;*

culty; the progress of the labour is more slow and painful; and, when the head has advanced so far that the crown presses on the soft parts at the bottom of the pelvis, there is much greater hazard of the tearing of the perinæum, than when the lengthened-out vertex presents: but, if no other obstacle occurs, the labour, notwithstanding, will, by proper management, generally end well; and much injury may be done by the intrusion of officious hands.

Secondly, *Face-Cases.*

Of laborious births, face-cases are the most difficult and troublesome. From its length, roughness, and inequality the face must occasion greater pain; and, from the solidity of the bones, it must yield to the propelling force of labour throes with more difficulty than the smooth moveable bones of the cranium. Our success in delivery in these cases will chiefly depend on a prudent management, by carefully supporting the strength of the woman.

The variety of face-cases are known by the direction of the chin; for the face may present.

1<sup>st</sup>, With the chin to the pubes.

2<sup>dly</sup>, To the sacrum.

3<sup>dly</sup>, and 4<sup>thly</sup>, To either side.

The rule in all these positions is, to allow the labour to go on till the face be protruded as low as possible.

It is often as difficult and hazardous to push back

the child, and to bring down the crown or vertex, as to turn the child and deliver it by the feet.

Sometimes a skilful artist may succeed in his attempt to alter the position, when he has the management of the delivery from the beginning; or in those cases where the face is considerably advanced in the pelvis, may be able to give assistance by passing a finger or two in the child's mouth and pulling down the jaw, which lessens the bulk of the head; or, by pressing on the chin, to bring it under the arch of the pubes, when the crown getting into the hollow of the sacrum, the head will afterwards pass easily. But, in general, FACE-CASES should be trusted to nature; and interposition by the hand, or instruments, is seldom advisable or even safe.

(3) *The Bulk, or improper Descent of the Shoulders* through the pelvis, rarely proves the cause of protracted labour. The head is always pretty far advanced before any obstruction can arise from this cause; and, if the head has already passed, in a pain or two the shoulders will follow. The same reasoning will also apply with regard to the aperture of the uterus itself. If the head passes freely, in like manner will the shoulders: the os uteri rarely, if ever, is capable of contracting upon the neck of the child, and thus preventing the advance of the shoulders; and, should this prove the case, what can we do but wait with patience? After the delivery of the head, if the woman falls

falls into deliquia ; or if, after several pains, the shoulders do not follow, and the child's life be in danger from delay ; we should naturally be induced to help it forward in the gentlest manner we are able, by passing a finger on each side as far as the axilla, and thus gradually pulling along : or, if this method fails, the shoulders may be disengaged by pressing on the scapula.

III. The third general cause of Tedious or Lingering Labour, arises from the PLACENTA, its Apendages, and the LIQUOR AMNII.

1. *The Membranes may be too strong or too weak.*— From the former of these causes, the birth is, in some instances, rendered tedious ; but, as the same effect is more frequently produced by the contrary, and the consequences are much more troublesome and dangerous, practitioners should be exceedingly cautious of having recourse to the common expedient of breaking them till there be a great probability that the difficulty proceeds from that circumstance ; and, even then, it ought not to be done till the parts be completely dilated, and the head of the child well advanced in the pelvis.

Many inconveniences ensue from a premature evacuation of the waters : for the parts then become dry and rigid : the dilatation goes on more slowly ;  
the

the pains often either remit, or become less strong and forcing, although not less painful and fatiguing; the mouth of the womb which was previously thin and yielding, may be observed to contract, and to form a thick ring, for some time obstinately resisting the force of the pains; the woman's strength languishes, and her spirits are overcome and exhausted; and, at last, the child's head becomes locked into the pelvis, merely from want of force of the pains to propel it.

An inconvenience of *too great rigidity* of the membranes is, that the child at full time may be protruded, inclosed in the complete membranous bag, surrounded with the waters. But such instances seldom occur. When the whole ovum is thus protruded at once, there is hazard of flooding from the sudden detachment of the placenta and membranes. It should, therefore, be prevented by breaking the membranes, when they advance and spread out at the os externum, and the head of the child follows in the same direction.

The method of breaking the membranes is, to pinch them between the finger and thumb; to push a finger against them in time of a pain; to run the file of catheter through them; or, when there is little water protruded, and they are applied close in contact with the child's head, they must be destroyed by scatching with the nail; but care ought to be taken

taken left the scalp of the child's head, covered with mucus, should be mistaken for the membranes.

2. *The Waters may be too copious, or too sparing.*—The first is inconvenient ; for, by this means, the weight of the water gravitating to the under-part of the membranes in time of a pain, may burst them too early, and occasion the disadvantages before-mentioned.

*An extraordinary quantity of Water*—may overstretch the womb, and prevent or weaken the pains. Such a cause of protraction may be suspected, if the first stage of labour goes on very slowly, if the woman be very big-bellied, and if much time be spent before the head of the child becomes locked in the bones of the pelvis. In these circumstances, if the pains should cease or become trifling, the membranes may be ruptured with safety and advantage.

*Little or no Water*—is sometimes contained in the membranes. The parts, then, stretch with more difficulty and pain, and must be lubricated from time to time with butter or pomatum, in the manner mentioned under the article of *Rigidity of the soft Parts*.

3. *The Cord may be too short, or too long.*—The extraordinary length of the cord, by forming folds round the child's neck or body, may prove the cause of protracted labour : but there is generally sufficient

length to admit of the birth of the child safely ; and it is time enough, after the child is delivered, to slip the noose over the shoulders and head. After the head is protruded, the shoulders are seldom prevented from advancing by folds of the cord round the neck ; and it very rarely becomes necessary to pass a finger between the child's neck and the cord, in order to divide the cord while the child is in the birth ; a practice that may be attended with trouble and hazard.

Another inconvenience of the great length of the cord, though it may also proceed from the low attachment of the placenta, is,

*The prolapsus or falling down of the Cord, doubled, before the Child's Head.*—A circumstance which often proves fatal to the child ; for, if it be not reduced by pushing it up within the uterus, beyond the bulky head of the child, and prevented from returning with the fingers, till the head, by the force of the pain, descends into the pelvis, the circulation will soon stop from the pressure of the cord between the head and pelvis, and the child will infallibly perish. If this method of reducing the cord should fail, or if the pains be too quick and forcing to admit of the attempt, a warm cloth should be applied to the os externum over the cord, to cover it from the cold, and the natural pains should be waited for ; if the pains be very strong and forcing, and the progress of labour quick, the child may yet be born alive. Some advise

to preserve the child, by turning and delivering by the feet ; but it is, at best, a precarious expedient : for new difficulties may afterwards occur ; the operation of turning is painful and hazardous ; and it would be extremely criminal to expose the mother's life to danger, when there is no certainty of preserving the child.

The navel-string is, sometimes, naturally thick and knotty ; or thickened, and of consequence shortened, by disease. If this happens, part of the placenta may be separated as the child advances, and a flooding ensue ; or, the string may be actually ruptured, and occasion the death of the child ; but such instances are very rare.

4. The fourth cause is, *The improper attachment of the Placenta over the Orifice of the Womb*, and is a more dangerous circumstance than any other ; for, if the delivery be not speedily accomplished, blood, from the separation of the placenta, will pour out so profusely, that the unfortunate woman will very quickly sink under it. This unhappy event can be prevented by no other means but by an expeditious delivery. The alarming situation of the woman will be sufficiently indicated by the appearance and rapid increase of flooding, and by the soft pappy feel of the after-birth to the touch. One half-hour's delay, or less, may in such circumstances prove fatal to the mother and the child ; therefore the friends should  
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immediately be apprised of the danger, and the earliest assistance be procured\*.

THUS, in all labours merely lingering, the delivery, under proper management, will end favourably; the head, in the most awkward position, where the pelvis is tolerably well proportioned, will collapse by pressure; and, though the progress for some time may be slow and gradual, the termination of labour is often as safe for the child, and the recovery of the mother as expeditious, as if the birth were accomplished by a few pains.

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## C H A P. II.

### *Of DIFFICULT or strictly LABORIOUS LABOURS.*

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**D**IFFICULT or *strictly* LABORIOUS Labours, are “those in which *nature* is unable to perform her office, and requires the *active* assistance of an artist, though the position of the child is natural.” They comprehend,

I. Those cases where the Hand alone is sufficient for the purpose.

II. Where instruments must be used.

S E C.

\* See method of delivery in flooding cases, class 4th of Preternatural Labours.

## SECTION I.

*Laborious Cases requiring the HAND alone.*

THE HAND alone affords the necessary assistance in laborious parturition ;

1. By turning the child in alarming floodings, before the head is wedged in the pelvis. How this is to be performed will be explained under the chapter of *Preternatural Labours*.

2. By reducing the umbilical cord, when protruded before the head.—In the same situation, the child may be sometimes turned: but this is only to be attempted after every method to reduce the cord hath failed ;—when there is a reasonable prospect of saving the child ; and,—when *turning* can be practised with perfect safety to the mother.

3. By altering the position of the head in *face-cases*, with a view to bring down the smooth cranium ; which should only be attempted when the face remains above the brim of the pelvis, with deficient or trifling pains, and the woman's life is in danger by floodings, convulsions, or from some other cause. More frequently assistance may be *then* given, by pulling down the jaw, with a finger or two introduced into the child's mouth, in order to bring the chin under the arch of the pubes, when the pains are insufficient to protrude the head in that position.

4. When one, more seldom both, of the superior  
extre-

extremities present along with the head. In these circumstances, the earliest opportunity that the state of the uterus will admit of should be taken, to pass the head well lubricated, in a conical manner, in the absence of pain, through the vagina and os uteri; endeavour gently, but at the same time with courage and resolution, to thrust back the child's hand and arm above the presenting head, to retain there with the fingers till a pain comes on, by which the head will be forced into the pelvis, the return of the arm prevented, and the delivery will be afterwards safely and naturally accomplished.

But, if the pains are strong and frequent; if the head is already wedged in the pelvis; if the woman appears to be well formed, especially if she has formerly had children, and the labour was natural and easy; if the head advances with the pains, and the hand of the foetus is close pressed between its head and the pelvis; in these particular circumstances the delivery should be trusted *wholly* to nature.

## SECTION II.

### INSTRUMENTAL *Delivery.*

**I**NSTRUMENTAL Delivery is of four kinds:

I. Where the child is intended to be extracted without doing any injury to it or the mother.

II. Where the foetus must be destroyed by diminishing

## GENERAL RULES for using the FORCEPS.

1. The forceps should never be employed till the first stage of labour be completely accomplished ; till the head of the child is protruded below the brim of the pelvis ; and till, by the continued pressure of the head, the tumor of the perinaeum is in some degree formed.

2. As the safety of the mother is our only apology for using instruments, the forceps should never be employed but in the most urgent and necessitous cases : as, for example, when the woman is much spent or exhausted : when the parts are swelled, along with *suppressio urinæ* ; when the pains are weak or trifling, or have ceased entirely, and are not likely to recur ; or when she is threatened with convulsions, floodings, or faintings.

3. The contents of the rectum and bladder should be emptied in all cases where instruments are employed to assist the delivery.

4. The position of the head should be exactly known before attempting to apply the forceps.

5. The position of the woman must be regulated by the presentation of the child's head. In the simplest and easiest of the forceps cases, when the head is so far advanced as to press considerably against the perinaeum, and the ears are nearly lateral or diagonal, she may be placed on her back or side, with her

breech over the edge of the bed; but, when the head is higher in the pelvis, and the ears towards the pubes and sacrum, the side, with the knees drawn up to the belly, as in natural labour, is the most commodious position both for the patient and operator.

6. The parts of the woman must be gently stretched and well lubricated with the hand gradually introduced into the vagina, and the operator should be able to touch the ear of the child with one or more fingers, before he attempts to introduce the first blade of the forceps.

7. The Accoucheur being placed on a low seat, or in a kneeling posture, let the right hand be slowly passed through the vagina into the pelvis, and search for the ear of the child, which will always be found under the ramus of the ischium, towards the pubes, or diagonally.

8. He must then, with the left-hand take up the first blade of the forceps, previously lubricated, and warmed if the weather is cold, and conduct it along the palm of the right-hand, between it and the head of the child, till the point of the clam reaches the ear. The handle must be held backwards towards the perinaeum to direct the point in the axis of the pelvis.

9. It must then be insinuated very slowly by a wriggling kind of motion, and the point kept close

nishing its bulk, with a view to preserve the life of the mother.

III. Where the *dimensions of the pelvis* are enlarged to procure a safe delivery to the child.

IV. The extraction of the foetus by the Caesarian Section.

§ I. CASES where the CHILD is intended to be extracted without INJURING IT or the MOTHER.

THE mechanical expedients for this purpose are,

1. The Scoop Lever, or single blade of the Forceps.

2. The Double Lever, or Two-bladed Modern Forceps.

I. The SCOOP or SIMPLE LEVER—the boasted secret of the celebrated ROONHYSEN, is extremely limited in its uses.

It may be employed where a slight stimulus is sufficient to rouse the pains, or where little force is necessary to alter the position of the head, by introducing it in the same manner and with the same precautions as a blade of the forceps: either at the lateral parts of the pelvis, under the arch of the pubes, or diagonally. But as there is great hazard of bruising the parts of the mother, by the resistance of the instrument, unless managed with so much dexterity that

the

the hand of the operator is the fulcrum or support on which its action turns; and, as it can only be used when the head is sufficiently protruded for applying the forceps, which are preferable both for safety and success; we consider the *simple lever* as a dangerous expedient in the hands of a young practitioner.

## II. The DOUBLE LEVER, or MODERN FORCEPS

### USE of the FORCEPS.

The forceps is an instrument intended to lay hold of the head of the child in laborious births, and to extract it as it presents. This instrument, as now improved, in the hands of a prudent and cautious operator, may be employed without doing the least injury either to mother or child.

The forceps, since their original invention, have undergone several important improvements and alterations. Those of Mr Wallace Johnston, lately improved, seem preferable to every other. Sometimes the head, when high in the pelvis, may be extracted by a long pair, such as the long forceps of Dr SMELLIE, Mr PUGH, or Dr LEAK; but their application and powers are difficult and dangerous, and they can only be used with absolute safety in the hands of an expert practitioner\*.

hands

\* See a figure of the improved forceps in Dr Smellie's Plates.

to the head of the child, pushing it on till it be applied along the side of the head over the ear.

10. The first introduced hand must then be withdrawn, the handle of the first blade steadily secured with it, and the other blade introduced, guided along the left-hand, in the same slow cautious manner and direction with the former.

11. The blades being applied over the ears of the child, and the handles placed exactly opposite to each other, these last are to be brought gradually together; carefully locked; and, lest they should slip in extracting, properly secured by tying a fillet or garter round them; but this must be loosed during the intervals of pulling, to prevent the brain from being injured by the continued pressure.

12. If difficulties occur in the introduction of the second blade, or in bringing the handles together, the resistance must not be attempted to be surmounted by force; but that blade should be withdrawn a little, and the point somewhat raised, by pressing the handle to the opposite side; and, if the second introduced blade cannot be made an exact antagonist to the first, it, or if necessary both blades, must be withdrawn, and again introduced as already directed.

13. It should be a constant rule, when difficulties occur in passing the forceps, to introduce the most troublesome blade first. The handles ought to be exactly opposite to each other, so that the locking may

may be easily accomplished. It is difficult and dangerous to attempt turning a blade by a semi-rotatory motion from the sacrum to the lateral part of the pelvis, or *vice versa*.

14. In locking the forceps, great care must be taken lest any part of the woman should be included in the hold.

15. If the handles of the forceps are too close together, or at too great a distance, the hold is unfavourable, and they will slip in making the extraction. The proper distance is nearly a finger's breath; a little more or less, according to the variety that occurs in the volume and figure of the child's head.

16. Having obtained a favourable hold, the extraction must be attempted in general with one hand only, while the other is employed to guard the perinaeum. As safety, not expedition, is the object in view, our efforts should be very slowly and gently performed, approaching as nearly to nature as it is possible for art to arrive. An inconsiderable exertion of mechanical power continued, or frequently repeated, will accomplish the end as effectually, and much more safely, than by precipitating the birth with a brutal rashness.

17. The motion in pulling must be equal and uniform in the line of the axis of the pelvis, always in a direction from blade to blade: the operator must rest from time to time; and while there is any appearance

pearance of pains, his efforts should co-operate with those of nature.

18. If the efforts of pulling are slowly exerted, the head in advancing will mould itself to the passage, and make the same mechanical turns as in natural labour.

19. When the head is disengaged from the bony cavity, the axis or curved line of the vagina must be carefully attended to: hence, though the line of action in the beginning of the operation is to incline the handles towards the perinaeum, as the head advances through the vagina the direction must be varied, by gradually raising the handles towards the woman's belly to disengage the occiput from under the pubes, till the head is entirely extracted.

20. As the soft parts are protruded, and the orifice of the vagina dilated, by the progressive advance of the child's head, the utmost caution is then necessary to guard the parts from immediate laceration; or, though they should escape it, the sudden or violent contusion may be attended with unhappy consequences. The perinaeum should, therefore, be constantly supported with the hand during the extraction.

21. When the head is completely extracted, the forceps must be removed blade by blade, and the subsequent part of the delivery finished as in natural labour. If the body does not soon follow, or if the pains are deficient or weak, the shoulders may be disengaged by

pressing on the back of the scapula downwards to the perinaeum, to bring the shoulders to it and the pubes, or diagonally till one or more fingers can be passed under the axilla to help forwards in that direction.

22. If, after several attempts the forceps cannot be securely applied, or, after a firm hold is obtained, the head does not yield to repeated efforts moderately exerted, they must be dropped, and the delivery otherwise managed according to the discretion and judgment of the practitioner.

#### PARTICULAR CASES.

IF the general rules for using the forceps are understood, we shall seldom be at a loss how to apply them in particular cases. They may be reduced to two general classes :

1. The smooth part of the cranium,
2. The face, presenting.

I. The variety of cases where the CRANIUM presents, chiefly are,

1. *Natural Presentation*, with the head so far advanced that the perinaeal tumor is considerably formed, the ears of the child nearly lateral, and the face to the coccyx.

The LEVER, by an expert practitioner, may be some-

sometimes in this presentation successfully employed.

If the FORCEPS are used, the woman may be either placed in the natural position, or on her back; it is scarce necessary, then, to tie the handles. When applied, a pain should be waited for. With one hand the perinaeum should be guarded; with the other, the handles of the forceps gently raised towards the woman's belly, to bring the hind-head with a half-round turn from under the arch of the pubes; the operator at the same time rising from his knees, if the woman be placed on her back.

2. *The Vertex presenting with the Face laterally in the Pelvis.*—The forceps can be seldom applied with safety in this position till the bulky part of the head has passed the brim, with the vertex pressing against the under part of the ischium, and till an ear can be felt under the arch of the pubes.

The ear when felt, will determine to which side the face points.

Let the woman be placed on the opposite side where the face is.

Let the blade under the pubes be first applied, with the fore-part of the clam, to the occiput of the child.

Let the second blade be introduced opposite to the first. Bring the handles together, and secure with a fillet.

Gently

Gently move from blade to blade ; favouring the direction (of the face to the sacrum) which the head as it advances naturally takes ; and, as the birth approaches, using the proper precautions to save the perinaeum.

3. *Fontanel presentations*—are the most difficult and dangerous of the forceps cases.

In the progress of the labour we generally find, when the crown presents, that the face points to the pubes ; but the position can be readily learned from the figure of the fontanel and the direction of the ear.

The common short forceps can seldom be successfully employed here, till the head be considerably advanced in the pelvis. The forceps should never be attempted to be applied in the fontanel presentations till an ear can be easily felt. They must be introduced over the ears, and the extraction conducted on the general principles ; carefully observing the direction which the head inclines to take, and proceeding in the most cautious deliberate manner, that the parts of the woman may have time to stretch.

When the fontanel presents, with the crown of the head nearly equal with the brim of the pelvis, and the face placed to the pubes or sacrum, the long axis of the head intersects the short diameter of the pelvis. Though the forceps be applied in this position, and a firm hold obtained, it is sometimes impossible to accomplish the extraction ; as the head will

will neither advance in the same direction, nor can the presentation be altered by pushing up and making the mechanical turns which Dr SMELLIE directs, without the hazard of injuring the mother.

If the common method, therefore fails, the forceps should be withdrawn, and the long ones attempted to be applied over the forehead and occiput. As the volume of the head, by the compression it suffers from the action of the forceps, will be somewhat diminished the extraction may be then successfully performed, and the child preserved.

If this method should also fail, in preference to the dreadful operation of embryotomy, Dr LEAK'S double-curved forceps with the third blade may be had recourse to. But of this expedient little can be said with confidence; for the introduction of a third blade into a narrow passage, when two have already perhaps been passed with difficulty, however ingenious the invention, is not easily to be put in practice.

All other varieties of cranial cases must be treated according to the rules already directed.

II. FACE PRESENTATIONS.—From its length and unequal surface the face will occasion greater pain, and from the solidity of the bones it yields to the propelling force with more difficulty, than the uniform moveable surface of the cranium. The head will, however, in most cases, advance in that position.

position, by the force of the natural-pains, though the delivery will be more slow or painful. I have seldom had occasion, in a well-formed pelvis, to interfere in face-presentations, in any other manner than by introducing two fingers into the mouth, and pulling down the jaw.

As the attempts of the most expert practitioners, if too early exerted, may be attended with fatal consequences; and, even when assistance is given at the proper time, our endeavours are often disappointed; in whatever manner the face presents, it should be allowed to advance as low as possible: by which means the access will be more easy; and the position, for the application of instruments, more favourable.

In these awkward positions, the injury occasioned by officious interference has been often fatal; whereas, if time had been given, and the patient properly supported, the delivery would have generally ended well.

The variety of **FACE-CASES** may be reduced to the following.

- 1<sup>st</sup>, The face presenting with the chin to the pubes.
- 2<sup>dly</sup>, To the sacrum.
- 3<sup>dly</sup>, Laterally.

Face-positions are readily known, from the inequalities of the surface to the touch; from the prominent

minent nose, the fissured mouth, &c. In these presentations, care must be taken, lest, by the pressure of the finger in touching, the eyes should be injured.

When the face is detained at the brim of the pelvis, with trifling or deficient pains, and any urgent circumstance occurs to render the interposition of art necessary; it may be sometimes successfully accomplished by the introduction of the hand into the pelvis, to raise up the face and reduce the position by bringing down the cranium as already directed in Lingered Labour.

The success of the practitioner, in these cases, will depend on the bulk of the head, the make of the pelvis, and the progress of the labour; for, should the head be firmly wedged in the pelvis, no force that can be employed with safety would be sufficient to alter the position.

In such circumstances we are sometimes advised to turn the child; but *turning* is a troublesome operation to the practitioner, hazardous to the mother, exceedingly precarious to the child; and ought, therefore, scarcely ever to be attempted.

In using the forceps in face-cases, the general rules must be attended to. More particularly let the following directions be observed.

1. Before the first blade of the forceps is applied, let the jaw of the child be pulled down gently with a finger or two introduced in the mouth.

2. Let

2. Let them be applied over the ears, with the locking parts between the nose and the lip.

3. In extracting, the operator should favour the inclination which the chin takes to the pubes. The chin must be entirely disengaged from under the arch of the pubes before the round of the head is extracted, otherwise there is great hazard of lacerating the perinaeum.

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§ 2. CASES where the FOETUS must be DESTROYED by diminishing its Bulk, with a view to preserve the MOTHER'S LIFE.

WHEN the infant could not be saved by the mode of delivery employed in the extraction, the operation was termed by the ancients, *Embryotomy*.

The object of this operation is to save the mother, when the child cannot be delivered in any other manner. It should never, therefore, be performed, while there is any reasonable prospect of extracting the child alive; and should, when consistent with the mother's safety, be delayed till the child be dead.

Extreme narrowness of the pelvis, or extraordinary bulk of the child, are the only circumstances which justify the necessity of having recourse to the horrid operation of embryotomy.

The chief cause of difficult labour, is diminished capacity of the pelvis from distortion. For when the  
brim

brim, instead of  $4\frac{1}{4}$ , inches from pubes to sacrum, measures only  $1\frac{1}{2}$ ,  $1\frac{3}{4}$ , 2 or  $2\frac{1}{4}$ , inches, the use of the scissars and crotchet is necessary; and if the transverse diameter comes short of 3 inches, the head of the foetus, unless the size be proportionally small or the sutures very open, is seldom protruded so low that the forceps can be successfully used.

We judge of the figure and dimensions of the pelvis, by the general make and construction of the woman; by the progress of the labour; by the touch. When the fault is confined to the bottom, it will readily be discovered: *e. g.* if a bump is felt on the anterior surface of the os sacrum, instead of a concavity: if the coccyx is angular towards the pubes; if the symphysis pubis is angular towards the sacrum; if the tuberosities of the ischia approach too near each other; or if one tuber be higher than the other; such appearances are decisive marks of a faulty pelvis.

When the narrowness is confined to the brim, it can only be detected by the introduction of the hand into the pelvis; and a considerable force and repetition of pain will be requisite to protrude any part of the child's head through the superior strait of the pelvis.

But, if the distortion be not considerable, if the structure of the child's head be loose, by the pressure it suffers between the pubes and sacrum, the head will be moulded into a conical or sugar-loaf form;

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by

by the overlapping of the cranial bones, the size will be reduced, and delivery accomplished in situations and circumstances where we would little expect it; which should make us cautious in the use of cutting instruments, lest life be destroyed unnecessarily.

We have now rejected the complicated apparatus of *iron specula* for stretching the parts, *screws*, *tire-tettes*, *hooks*, *griffin's talons*, *forceps with claws*, and other *horrid instruments* of destruction invented by the ancients for the laying hold of and extracting the child; an operation by these means so difficult and dangerous, when the head was bulky and the pelvis narrow, that the woman frequently lost her life in the attempt.

At present, we endeavour, as much as is necessary or practicable, to diminish the size of the head, by opening the cranium and evacuating the brain, previous to the extraction.

This is a modern and important discovery.

The instruments for performing the whole operation consist, simply, of a *Pair of Long SCISSARS*, with a *CROTCHET* or *Blunt Hook*.

When the ordinary means of delivery have failed, or cannot be employed; and the expediency of destroying the child to preserve the mother, after the most deliberate reflection, has been determined; she must be placed in the same position, according

to the presentation of the head, as directed in *Forceps Cases*.

The same general rules, as far as practicable, in using the scissars and crotchet, must be also observed.

Even in the narrowest pelvis that occurs, previous to opening the cranium, the soft parts ought to be completely dilated, when the dilatation can be safely waited for, and the head of the child somewhat fixed in the pelvis; for, while the uterine orifice is in a thick contracted state, and the head remains at a distance, no part having yet been forced within the brim, the application of instruments is difficult, even in the hands of an experienced practitioner; and hazardous under the management of a timid operator.

But, if the patient is delicate or weakly, if the pains are frequent and teasing, if the progress of dilatation of the uterine orifice be slow, and there is reason to suspect considerable resistance to the extraction of the head from the distortion of the pelvis, the opening, with a view to diminish the volume of the child's head should be performed as soon as there is easy access to apply the scissars. We can then afford to wait, that a convenient interval may take place between the first and subsequent part of the operation; a material advantage to facilitate the extraction, and most essential to the safety of the patient.

## I. USE of the SCISSARS.

THE scissars are chiefly employed for perforating the cranium of the foetus, in order to diminish the volume of the head; and also for opening the cavities of the thorax and abdomen, when enlarged from monstrosity or disease; or for dividing or separating luxuriant parts.

The scissars employed as a perforator should be fully nine inches long; viz. the blades three, and the handles and bows six. The points should be sharp, not the edges. They should have a small degree of curve towards the points; and be provided with buttons, knobs, or rings, instead of the angular rests commonly used, which are apt to bruise or wound the parts of the woman\*.

The method of using the scissars is as follows.

The left-hand of the operator must be slowly introduced through the vagina to the presenting part of the child, and along it the points of the scissars, carefully guided till they press against the cranium of the child, which they must be made to perforate with a boring kind of motion, till they are pushed on as far as the rests; they must then be opened fully, carefully re-shut,

\* See a description of the Scissars and Crotchet in Dr Smellie's Tables, Pl. xxxix.

N. B. The reference here mentioned always allude to the Edition of these Plates reduced from the Folio Edition.

re-shut, half-turned, and again widely opened, so as to make a crucial hole in the skull. They must afterwards be pushed beyond the rests, opened diagonally again and again, in such a manner as to tear and break to pieces the bones of the cranium, and destroy the texture of the brain; they must then be shut with great care, and withdrawn along the hand in the same cautious manner as they were introduced, lest they should cut or tear the uterus, vagina, or any other part of the woman. After a free opening in the cranium has been made, the brain must be scooped out with the fingers, blunt-hook, the single lever, or a common spoon; and the loose sharp pieces of bone must be carefully separated and removed with the fingers of the operator, or a pair of small forceps, that no part of the woman be wounded in the subsequent attempts for extracting the head. The teguments of the scalp should then be brought over the ragged bones of the cranium; and the woman should be allowed to rest for twelve, twenty-four hours, or longer, according to her strength and other circumstances: the bones of the cranium will afterwards collapse; and if the patient be not much exhausted, or the pelvis not exceedingly distorted, the head, its volume having been considerably diminished, will be protruded by the force of natural pains. If these are not sufficient, it must be extracted, either by means of two fingers introduced within the cavity

of the cranium, or by the blunt-hook introduced in the same manner, guarding the point on the opposite side while making the extraction. If these fail, the crotchet must be employed ; which, though dangerous in the hands of a rash, careless, or ignorant operator, may be used by a skillful practitioner with as much safety as the bluntest instrument, and is in fact more manageable than the blunt-hook.

## II. USE of the CROTCHET and BLUNT-HOOK.

The method of introducing the crotchet is, to conduct the point along the hand, like the scissars, till a secure hold of the child's head be obtained.

It was formerly usually applied on the outside of the skull only : but the hook should be always introduced within the opening, and the hand of the operator should be passed into the vagina to press the fingers on the outside of the cranium opposite, during the efforts of pulling with the crotchet, lest by losing its hold it should injure the woman ; the consequences of which might be very unfortunate or even fatal.

Dr SMELLIE directs the crotchet to be fixed on the *outside* of the skull, which is more difficult and hazardous than the method now employed ; and his  
directions

directions have been, till of late, very generally followed\*.

When the hook slips its hold, the loose pieces of bone must be carefully separated and removed with the fingers; the crotchet must again be applied a little higher, and the pulling force repeated as before: proceeding in this manner till the superior part of the cranium is cut and divided, and the substance of the brain discharged.

The chief objects to be attended to be in the introduction of the hook, are, first to guide the point with the fingers within the opening of the cranium; then, by moving it backwards and forwards, to pervade the bone so as to secure a firm hold; and, lastly, in extracting, to guard against the accidents of wounding or otherwise injuring the woman, which might readily happen if it should lose its hold.

In the first part of the operation, for the reasons already

\* “Some writers direct us to introduce the crotchet within the skull, and, pressing one hand against the point on the outside, pull along. But this is a *trifling expedient*: and, if a good deal of force is used, the instrument tears through the thin bone, and hurts the operators hand, or the woman’s vagina, if not both: Whereas, in the other method, there is much more certainty, and a better purchase to force along the head, which collapses and is diminished as the brain is discharged, and never comes down in a broad flattened form, according to the allegations of some people whose idea of these things are imperfect and confused,” &c. *Smslie’s Midwifery*, Book iii. sect 7.

already mentioned, the point of the crotchet should never, if possible, be trusted beyond where the fingers can easily reach.

One blade, in general, is sufficient to be employed for the extraction. Both branches can seldom be used at once with advantage or safety.

After the brain is discharged, the *blunt-hook* may be successfully employed as an extractor, where the pelvis is not remarkably faulty. The small end is to be passed into the opening of the cranium, and the point to be guarded with great care, by pressing externally on the cranium, opposite, as in using the crotchet.

As cases of extreme narrowness of the pelvis from distortion very seldom occur, the head will, in general, yield to repeated efforts of pulling, in the manner just now directed.

If this method should fail, the crotchet must be introduced within the opening as before, and fixed in the basis of the skull where a secure hold can be obtained; the handle should be covered with a cloth, to enable the operator to take a firm hold; the point should in general be directed posteriorly to the mother; and in employing the necessary exertions of pulling, the axis of the pelvis and vagina should be attended to. The operator should then endeavour to bring down the head by pulling at first moderately, and at proper intervals increasing the  
force

force according to the resistance from diminished capacity of the pelvis. He must reserve his own and patient's strength, by resting from time to time, supplying her with suitable nourishment; and, in a word must persevere in his endeavours to finish the extraction in the best manner the circumstances of the case will admit of.

In face-cases, where it is impracticable to alter the position, and when the pelvis is much distorted, the the double crotchet is recommended; the handles must be well secured, kept well backwards towards the perinaeum, and the motion always from blade to blade. It very seldom, however, happens that there is occasion for the double crotchet: by this means the head is flattened in pulling, and prevented from taking the proper direction; whereas if one blade only be employed, the head is lengthened, and in pulling can better accommodate itself to the shape of the pelvis as it passes along.

Besides, in face-presentations, by applying one blade only towards the lateral part, and pulling obliquely to the opposite side, the position may be altered, and easy access at last obtained to the hairy scalp, to make the perforation, evacuate the brain, and diminish the volume of the head.

When the head is extracted, if from extreme narrowness of the pelvis the shoulders should give considerable resistance, a crotchet must be fixed in the  
shoulder,

shoulder, in order to bring down one of the arms, and by pulling at it and the remaining portion of the head covered with a cloth, easy access will be procured to the other arm, which must be managed in the same manner. The crotchet must then be fixed in the trunk among the ribs, the thorax and abdomen opened if necessary, and the delivery accomplished by tearing the child away in pieces.

Should it be possible for a case to occur, which by the bye is scarce within the reach of reason to comprehend, an accident which can only happen to an ignorant or very blundering practitioner, where the vertebrae of the neck have been divided by the crotchet, and the head severed from the body, both being still retained in the pelvis: In these circumstances, the head, if it cannot be extracted first, must be pushed up above the brim of the pelvis, the crotchet or blunt-hook must be fixed under the axilla, the arms must be brought down, and the body extracted, by fixing the crotchet below the scapula, on the sternum, or among the ribs \*; a method preferable to that of turning,

\* Such a case actually occurred to the late Mr Robert Smith surgeon in Edinburgh soon after he began to practise. The particular circumstances of this single history, as communicated to me by Mr Smith himself, are as follows.—A young woman had been several days in strong labour; the head, he imagined, had originally presented in an oblique direction at the brim of the pelvis. The patient was so much exhausted when Mr Smith was called, and

turning, as some advise. The head must afterwards be extracted with the crotchet.

In those cases of narrow pelvis, where it is absolutely necessary to diminish the volume of the child's head to procure the extraction with safety to the mother, our success will chiefly depend on a seasonable performance of the first part of the operation. The head should be opened, and the brain discharged, as soon as the dilatation of the orificium uteri will admit of it. The woman may be then safely allowed to rest for 24 hours or more, even till the compages of the

and she was otherwise seemingly so low, that it was doubtful to him whether she could support the fatigue of delivery. The case appeared the more discouraging and unfavourable, because, on touching, he could not determine the manner in which the child presented, its head having been formerly cut off from the body by an unsuccessful attempt to procure a delivery; nor could he even positively say, whether it was a fœtus, or a very singular monstrous production, from the uncommon feel which the ragged stump of the neck gave to the touch. Determined, however, to give the woman a chance of life, he fixed a crotchet in the part which presented, brought down first one arm, then another; and afterwards, to his astonishment, extracted the trunk of a *body without a head*. On inquiry, he was informed that a surgeon in the neighbourhood had in vain, after many fruitless efforts, attempted to make the extraction, but abandoned the woman in that situation, and assured the relations it was not possible to accomplish the delivery; which they had artfully concealed from Mr Smith. The head was afterwards extracted with the crotchet, and the woman had a good recovery.

the cranial bones of the foetus be somewhat dissolved by putrefaction; the natural pains, during that process, will either be sufficient to accomplish the birth; or the head will by their means be protruded so low, that the access will be easy to apply the crotchet, and little force be necessary to procure the extraction. Whereas, if the first part of the operation (to wit, making a sufficient opening into the cranium for the discharge of the brain) be too long delayed, the consequence of violent mechanical force employed, where the extraction must be performed in haste, may be fatal to the patient.

For the propriety of this practice we can appeal to the experience of every practitioner; and if arguments were necessary to enforce it, we might refer to various histories mentioned by authors, where the head of a foetus in a semi-putrid state was expelled by the natural pains, after it had been severed from the body and retained in the uterus for several days; the unfortunate woman having been abandoned to the most deplorable state of despair by the inhuman operator.

It is astonishing, that the rule of observing an interval between the first and second steps of delivery in *embryulcia* should be regarded, in the writings of the latest author on this subject, as a trifling insignificant precaution, when the facility of the operation to the practi-

tioner, and safety of the patient, so much depend on it\*.

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§ 3. *Cases where it is proposed to enlarge the DIMENSIONS of the PELVIS to procure a safe passage to the CHILD without materially INJURING the MOTHER.*

**M.** SIGAULT is chiefly intitled to the honour of having first proposed, and successfully performed, this operation. M. Le Roy, however, one of  
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\* “ It has of late become fashionable in practice, when the head has been opened, and the brain evacuated, to suffer the remainder of the delivery to be effected by labour, or, if this is insufficient, to postpone it for some hours or longer, in order to suffer the bones of the cranium to collapse and be pushed forward, and the woman to be refreshed. But this delay seems totally improper: 1. Because the opening of the head should not be attempted whilst the woman is capable of bearing so much longer labour, under the expectation, or the hope at least, that the effects of so much farther delay might possibly bring it within the reach of the forceps. 2. There is no necessity for greatly fatiguing or exhausting the woman in opening the head, or even in bringing it down, provided it be sufficiently reduced in its size. 3. If any inflammation has taken place, the soreness will be greater after the delay. Lastly, Bad symptoms and accidents may occur during the delay.” *Foster’s Midwifery*, p. 171.—The directions in this Treatise for opening the head and extracting with the crotchet, are, in other respects, concise and explicit. See from cccxxxii. to end of cccxxvi.

the most eminent teachers and practitioners of Midwifery in France, who divided the honour with M. SIGAULT, deserves also to be here mentioned. He was presented, at the same time, with a medal from the Faculty of Paris; introduced, along with M. SIGAULT, to the king; assisted personally at the operation, and first published an account of it.

But although the success of a few cases shows that the articulation at the cartilaginous *symphysis pubes* is capable of division by incision with safety to the patient, tearing the bones forcibly asunder by violent extension of the thighs, till they are so widely separated as to procure a considerable increase in the dimensions of the pelvis, must be a precarious and hazardous operation: Precarious, in affording sufficient space to admit of the extraction of a living child, where the pelvis is considerably contracted from distortion; and hazardous in its consequences to the mother, when much force has been employed either to obtain a separation of the bones, or afterwards to accomplish the delivery, where there is considerable resistance to the extraction of the foetus.

This is sufficiently proved from the event of several cases, particularly of two histories related in an inaugural dissertation by Dr BENTLY \*, where this operation was performed on the living body; the

\* Published at Strasburg 1779. See Edinburgh Medical Commentaries, part iii. for the year 1780.

one by Professor SIEBOALD of the university of Wurtzburg in February 1778, the other by Dr GUERARD professor of anatomy at Duffeldorpe in May following.

In the former, little space, not more than a finger's breadth, after the utmost force that could be safely applied, was procured : and a dead child was with difficulty extracted. Fever ensued after the operation, urine for several weeks passed by the wound, the bones exfoliated, and the patient recovered with difficulty.

In the latter case, though the bones of the pubes were separated fully an inch and a half from one another, the advantage obtained by it was so immaterial, that the child was with difficulty extracted piece-meal ; the consequence was, that, notwithstanding every possible care and attention, the violence employed in forcing the bones was fatal to the woman, who " was so much reduced and spent, that she died the 10th day after the operation."

It has been successfully practised, however, since SIGAULT's operation, in different parts of France by M. DESPRES accoucheur in Brittany, M. GAMBON at Mons in several instances \*. M. NOGEL

\* Recherches Historiques, &c. sur la Section de la Symphyse du Pubes, par M. Alphonse le Roy, &c. Paris. 8vo, 1780.

GEL chirurgien accoucheur †, and others; once in Spain, and once and again in Holland. But it has repeatedly failed in procuring a safe delivery to the child, and been fatal to the mother; the bladder has been often wounded, incurable emission of urine and other dreadful accidents have followed.

We may therefore conclude, that altho' in certain circumstances the division of the ossa pubis by incision at the symphysis may be practicable and safe, the separation by extension is uncertain and hazardous. It might perhaps, in some *rare instances*, be the means of preserving a child who would otherwise be the victim of the operation of embryulcia; but as the advantage derived from it by augmenting the transverse diameter of the pelvis at the superior aperture is trifling, it can seldom be successfully performed with respect to the child, where the distortion is so considerable as to destroy the capacity of the basin, and render delivery by the scissars and crotchet necessary; a method which will always obtain the preference in every well regulated state, and with every humane practitioner, if the Sigaultian operation exposes the life of the more valuable parent to danger.

The operation consists in making an incision with a scalpel through the common integuments and soft parts,

† Anatomie des Parties de la Generation, &c. Seconde Edition Augmentée de la Coupe de la Symphise. Par M. Gautier Dageoty, pere, anatomiste pensioné de Roi. A Paris 1778.

parts, in the direction of the commissure of the ossa pubis. The articulation at the cartilaginous symphysis, must afterwards be divided by the same instrument. The knees of the patient are to be kept gently separate by an assistant. A catheter is directed to be introduced, to prevent the accident of wounding the bladder in the operation; and we are advised, for the same reason, to make the incision, both of the soft parts and cartilages, a little towards the left side. The distraction of the bones is afterwards to be attempted, as far as is necessary or practicable, by a cautious and gradual extension of the thighs.

The operation being finished, the contractile efforts of the uterus are to be waited for to expel the child. The patient is afterwards to be confined to bed for several weeks, a bandage to be applied round the loins, and the management directed on general principles. But if the natural pains should then fail, the scissars and crotchet must be used; the child must be turned; or the Caesarian section had recourse to.

The first proposition, by destroying the child, disappoints the original intention of the operation. For, if the mother could be delivered by the crotchet with safety, at the expence of destroying the child, that method will always be preferable to a precarious attempt to save the child, at the hazard of the mother's life. If the pain and danger she suffers in the new operation, is not to be compensated by

a moral probability of saving the child, the operation is then *entirely useless*. And again, if it should fail to enlarge the dimensions of the pelvis, and embryulcia be afterwards necessary, the mother, in that event, is wantonly exposed to the increased danger arising from both operations combined, with the additional hazard from the violence of mechanical force employed to extract the child, after the parts which suffer in the first operation have been wounded, and the bones torn from each other.

The great stress applied to the nervous aponeurotic parts, at the sacro-iliac symphysis posteriorly, may of itself also be fatal to the patient, or prove the cause of incurable lameness, independent of the other accidents incident to the operation.

With all deference to an authority which is universally respected, and which in few instances has been called in question, we must beg leave to differ in opinion from Dr HUNTER, whose sentiments on this subject, though in general unfavourable to the operation, incline him to suggest, "that the crotchet may be employed with safety to the mother when it fails."

The second method, of attempting delivery by *turning*, with a view to save the child if the natural pains should be insufficient to protrude the head, after the bones of the pubes have been divided by SIGAULT'S operation, although we are informed it

has

has been successfully practised in one or more cases in the Continent, is a most dangerous expedient to the mother. The prospect it affords for the safety of the child in a narrow pelvis, is too remote to encourage an experienced practitioner, who knows the difficulties that often attend turning in more favourable circumstances, to engage in this troublesome task. Such a proposition in this country would be rejected with contempt by the generality of practitioners.

The *Cæsarean section* is the third method proposed for accomplishing delivery with safety to the child, the section of the pubes having failed, if the child cannot be easily extracted by the crotchet. It hath actually been practised in a single instance, under the circumstances just now mentioned. It is needless to add, that the unhappy patient soon after died. A recovery, under such complicated sufferings, would have been almost miraculous; and few practitioners will be hardy enough, if their misguided judgement were permitted to rule, to venture a second time on an experiment so strictly desperate.

Dr LEAK has, with his usual judgement, good sense, and humanity, considered the advantages and disadvantages of the Sigaultian operation; and seems to favour it in preference to the Cæsarean section, because the former “ does not carry with it  
“ those ideas of cruelty which attend the latter,  
“ where the patient is, as it were, embowelled alive.

“ No

“ No formidable apparatus is necessary, the section being made with expedition, and without pain and danger: no blood-vessel, nerve, or other parts essential to life, are wounded; those divided being only *cutis, cellular membrane*, and insensible cartilage, from which neither *hemorrhagy* nor *symp-tomatic fever* are to be apprehended\*.” He is therefore inclined to think, that with those “ who are disposed to give this new operation a fair and judicious trial, as *it has already succeeded, it will again succeed.*” But though, in the body of a dead female subject in the Westminster lying-in Hospital, the bones of the pubes after incision receded  $2\frac{1}{8}$  inches without much violence, it does not appear that any considerable acquisition of space in the dimensions of the pelvis was procured by it. I have had occasion to make the same experiment in repeated instances on the dead subject with no better success.

Upon the whole, therefore, from all the information we have yet received of the event of this new operation, we have little reason to adopt it in preference of the method of delivery by the crotchet, wherever that instrument can be used with safety to the mother; and, as the space to be gained by it is as uncertain as the exact dimensions of the child's head before delivery

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\* Dr Leak's Practicable Observations on the Child-bed fever, &c. 5th edition, p. 255.

livery, it would be rash and unwarrantable to adopt an expedient, precarious with respect to the child, and highly dangerous to the mother, in substitution of embryulcia; which, if not too long delayed, may, in the present improved state of the art, be employed in most cases of distortion with *perfect safety* to the mother, who is always justly intitled to the first place in our intentions, and whose valuable life is the most interesting and important object of our regard.

§ 4. *Method of EXTRACTING the CHILD by the CÆSAREAN SECTION.*

WHEN the child could not be delivered by the natural passages, or when a woman died undelivered though the child was probably alive, an operation with a view to preserve the mother and child in the first case, and to save the child in the latter, has been strongly recommended. It is supposed by many authors to be safe and justifiable in the former case, but has been warmly reprobated by others.

It is styled *Caesarean Section* from Julius Caesar, who is said first to have received his appellation from this circumstance of his birth, and in his turn to have conferred it on the attempt. There is much reason, however, to suspect, that this relation, like many other stories of Pliny, is fabulous; and it is more reasonable to suppose that the name, in fact, was the chief

chief origin of the story. The same author attributes the birth of Manlius Scipio to the same operation. But in those days the Grecian physicians were held in abhorrence for the cruelty of their operations, and it is scarcely probable they would then dare to propose the delivery of the child by an expedient which appeared to be as rash and formidable in the attempt as dangerous in the consequences. If there is any foundation for the story, it probably refers to the attempt of saving the child by this operation in cases of the sudden death of the mother: for there is no certain accounts of its having ever been performed by the ancients on the living subject.

Books are full of histories to show that Histerotomy has been practised with success by the moderns on various occasions; yet authors are much divided in opinion on the subject. Some positively deny that a woman can survive the daring attempt: while others contend that it is frequently safe, though generally dangerous; and relate many examples where it has not only been performed with success, but repeatedly practised on the same subject.

MARCHANT, MAURICEAU, GULIMEAU, PARE, OULD, and others of equal authority, have expressly written against it.

SIR FIELDING OULD calls it “ a detestable, barbarous, and illegal piece of inhumanity;” and endeavours

deavours to prove the improbability, and even impossibility, of its success, from its analogy with other wounds, as well as the anatomy of the parts. He is at great pains to invalidate the authority of BAUCHIN, ROUSSET, LA MOTT, and other favourers of that unparalleled cruelty, by denying the facts they have endeavoured to transmit to posterity in support of it. None of these cases, he hopes, will gain any credit from the readers of the present age. He considers these histories as fable and imposture, and concludes “ from reason, theory, anatomy, and every thing consistent with surgery, that the Caesarean operation must be certainly mortal; and hopes it will never be in the power of any one to prove it by experience \*.”

On the contrary, if we could rely on the testimony of authors, since the first accounts of the Caesarean section successfully practised by a common sow-gelder on his own wife in the beginning of the 16th century \*, many well attested histories appear on record in which it is said to have been successfully performed.

But the accounts which history transmits, both of the cases and causes for the operation, are so vague and absurd, they carry along with them so little appearance

\* Ould's Treatise of Midwifery, p. 196,

\* *Vide* Bauhin's Appendix to Rouffet's Treatise.

pearance of probability, that nothing can be concluded from them; and, in fact, such fabulous histories should be received rather with incredulity than confidence. Successful events are introduced with much pomp in the writings of authors. One author copies from another, the name is changed, many of the circumstances are disguised; in this manner a single case has given rise to several. Authors, on the contrary have been generally silent when the event was unfavourable. Even the testimony of M. SOUMAIN, DELA PYRONIE, LA FAYE, of France, and others who have written in favour of the operation \*, if we should acknowledge the authenticity of the cases, afford little foundation to encourage us to perform it on the living subject.

We shall next, therefore, inquire into those circumstances in which the operation is supposed to be necessary, in order to show, that, in general they are insufficient indications for having recourse to it.

*Hysterotomy*, according to authors, should be performed when the pelvis is faulty; when the passages are contracted by constriction from cicatrix, callosities,

\* See Mem. of the Academy of Surgery, tom. I. & II. ; Edinburgh Medical Essays; Heister's Surgery; Burton's Midwifery; London Medical Essays and Inquiries, &c.

ties, or tumors any where about the vagina or ostincae; when the uterus is torn, and the child escaped partially or wholly into the cavity of the abdomen; in cases of extra-uterine conception; herniae of the uterus; when the position of the child is unfavourable for turning; or, the mass of the foetus of an extraordinary size.

I. *Diminished Capacity of the Pelvis, from bad Conformation of the Bones.*—It is only when the hand of the operator cannot be admitted within the aperture of the pelvis, or, in other words, when the narrow diameter at the brim or bottom does not exceed from one to two inches, that this operation is justified by modern practitioners in consequence of distortion. For, when the capacity of the pelvis is so strait as not to permit any part of the child's head to be protruded through the superior aperture, not to admit two fingers of the Accoucheur's hand at the bottom to conduct proper instruments with safety to open and diminish the foetus's head, and secure a firm hold to procure the extraction, the Caesarean section has been practised, or the unfortunate woman become the victim of the imperfection of the art.

In the city of London, during about 100 years, of between 50 and 60 women whose pelvises have been much distorted, the Caesarean section has only been performed in two instances, viz. by Mr THOM-

SON Surgeon to the London Hospital, and by Mr J. HUNTER\*. In all others the child was delivered by embryulcia; yet I am well informed not above 5 or 6 of the whole number of women just now mentioned, died in consequence of the violence employed in delivering with the crotchet †. Happily such a structure as to reduce the capacity of the pelvis within so narrow limits, very seldom occurs in practice; hence in the present improved state of the art, the necessity for the frightful, horrid, and awful expedient of the Caesarean section, must be very rare and uncommon, even when a bold practitioner would hazard the performance of it.

In the subject of the Caesarean section, whose history is related by Dr COOPER and Mr H. THOMSON, London Medical Essays and Inquiries, Vol. IV. already referred to, the transverse diameter of the pelvis at the brim, to wit, from the upper part of the sacrum to the opposite symphysis pubes, measured only  $\frac{7}{8}$ ths of an inch.

In the case related by Dr COOPER, Vol. V. of these Essays, the greatest space of the transverse diameter at the brim did not exceed  $1\frac{1}{4}$  inch, to wit,  
from

\* *Vid.* London Medical Essays and Inquiries, Vol. IV. V.

† In the former imperfect Edition of this Work, the proportion of women saved and destroyed by embryulcia was reversed. The Author was led into this mistake by misinformation from a respectable Accoucheur of London.

from the projection of the sacrum to the symphysis pubis; and gradually became narrower at each side, till it terminated laterally in a small point\*. At the bottom the rami ischii were so much contracted, that the space between them was somewhat less than half an inch.

It is obvious to a demonstration, that the volume of the head of a mature foetus cannot, by the operation of embryulcia, be diminished to such a size as to render it capable of passing through a pelvis whose dimensions do not exceed either of those just now mentioned.

The following case, however, shows the perfection to which we have now arrived in the construction of obstetrical instruments. Dr KELLIE extracted a mature foetus through the openings of a distorted pelvis, whose dimensions were these: Transversely at the brim from the arch at the sacrum to the symphysis pubis, 1 inch  $\frac{5}{8}$ ths and  $\frac{1}{7}$ th; on the right-side of the strait,  $2\frac{1}{8}$ th inches; on the left-side,  $1\frac{1}{2}$  inch. The woman had been five days in strong labour before Dr KELLIE had an opportunity of seeing her. “ The head remained above the brim of  
“ the pelvis, and had not then made the smallest  
“ progress. It was of a large size, firmly ossified;  
“ and the parts in the passages were so extremely  
“ tender,

† London Medical Essays and Inquiries, Vol. V. p. 225.

“ tender, that the poor woman, who was somewhat  
“ faint and much fatigued by the protraction of  
“ labour, could not bear the most gentle examination  
“ without great pain.” The Doctor proceeded to  
perform the operation of embryulcia “ by making  
“ a large opening in the cranium, which was effect-  
“ ed with difficulty, on account of the head project-  
“ ing so much over the pubes that the shank of the  
“ scissars was pressed forcibly against the perinaeum,  
“ to get the points in a proper direction.” He now  
left the patient ; and on returning, in 24 hours af-  
ter, “ found the head advanced into the pelvis so  
“ low, that the jagged end of one of the parietal  
“ bones pressed against the inner part of the perinaeum,  
“ very near the os externum. By the help of the  
“ blunt-hook only, the head was brought forth, in  
“ little more than a quarter of an hour, amazing-  
“ ly flattened.” The shoulders and body gave con-  
siderable resistance, but were also extracted with the  
blunt-hook.

It is much to be regretted, that the unfortunate  
patient, who seemed to do well for a week, “ having  
“ imprudently drank freely of raw porter, with some  
“ people who came to see her, was afterwards sei-  
“ zed with a violent purging, of which she died in  
“ three days\*.”

The

† Johnson's Midwifery, page 284.

The above case affords, however, an important lesson of instruction to practitioners of midwifery. If, after the patient had been five days in hard labour, the head of a mature foetus could be trusted for 24 hours after opening to the natural pains, and pass through a distorted pelvis of the dimensions above mentioned, so low as to press with the parietal bones against the perinaeum, and be capable of extraction with the blunt-hook;—we need not despair of attempting delivery with the scissars and crotchet, where the pelvis comes somewhat short of these dimensions, if the head be opened early. For, by waiting with patience, as long as there is time for it, the head will collapse, and be protruded so low by the force of the pains, that the access will afterwards be easy to apply the crotchet; so that by pulling with it, and assisting with the fingers to adapt the small axis of the head to the least diameter of the pelvis, the extraction will be accomplished with facility and safety.

The projection of the angle of the sacrum towards the pubes, is by much the most frequent mode of distortion. In some instances, the intermediate space is so inconsiderable, that the diameter at the brim is divided, as it were, into two cavities. In this species of distortion, it is evident, on account of the distance of, and consequently difficult access to, the presenting part of the child, that the danger in

embryulcia will be proportionably considerable: for if the narrowness at the brim proves an unsurmountable obstacle to the passing, and the figure and *distortion at the bottom* prevents the introduction of the hand to direct and apply the proper instruments with safety to the mother: in such circumstances we must either abandon the patient to utter despair, or by the last resource of desponding hope endeavour to save her.

It remains, then, to inquire,

1. If dividing the bones of the pubes by the lately invented operation, affords a reasonable prospect of procuring even a safe delivery to the mother when it cannot be accomplished by embryulcia?

2. Is the capacity of the pelvis, in any instance, so much destroyed, from distortion, that a dead child cannot be extracted by means of the scissars and crotchet?

First, Where the pelvis is so much distorted, that, the diminution of the child's head to somewhat more than half of the usual size is insufficient to render delivery practicable, SIGAULT'S operation could have little effect to enable the head to pass unless its volume had been previously lessened. Some advantage would then be gained by dividing the bones of the pelvis; but not so much as to encourage us to hope that the child would afterwards be propelled by the natural pains, or in these circumstances, extracted by

the

the crotchet, without employing a degree of violence which might probably be fatal to the mother.

Secondly, That the aperture of the pelvis is, in some cases, so narrow from distortion, as to prove an unsurmountable obstacle to the passage of the child by embryulcia, the histories of the Caesarian section in the 4th and 5th volumes of the London Essays already referred to, afford striking and incontestible examples.

In the pelvis of a woman on whom the Caesarean section was performed by Dr YOUNG, late professor of midwifery in the University of Edinburgh, the transverse diameter at the brim does not measure above  $1\frac{3}{4}$  inches at one side; the bones of the pubes are bent, and refuse admittance to a finger at the arch; the sacrum is convex anteriorly; the anchylosed coccyx is angulated; and the distance from it to the tuberosities of the ischia is somewhat less than  $1\frac{3}{4}$  inches. In a pelvis of this construction, where the bottom, and indeed whole capacity, are affected by the distortion, embryulcia could scarce be attempted.

In a collection of bones, in my possession, the construction of a distorted pelvis of a female skeleton is still more unfavourable for the operation of embryulcia than any of those yet mentioned. The diameters at the brim are almost entirely destroyed by the projection of the lumbar vertebrae and convexity of the sacrum; distance at one side from the sacrum to the ilium being  $\frac{3}{4}$ ths of an inch only.

It is sufficiently apparent, that here nothing but the Caesarean section could give the patient the most distant chance of life from the danger which threatened.

It is probable, therefore, that a faulty pelvis, whose smallest diameter at the brim or bottom does not exceed  $1\frac{1}{2}$  inch, or  $1\frac{3}{4}$ , is one motive for the desperate resource of the Caesarean section. The difference in the size and structure of a child's head may also render it necessary, where the transverse diameter of the superior aperture of the pelvis, and lateral one of the outlet, somewhat exceed the dimensions just now mentioned.

Before we inquire into the practicability of the Caesarean operation with a probability that the mother will survive it, we shall next endeavour to show that *all the other* cases in which it has been performed or proposed are improper indications for it.

II. *Constriction from Cicatrix, Callosity, and Tumors, any where about the Vagina or Os Tincae.*—The vagina and os tincae are often affected with constrictions from cicatrices, with callosities and tumors; but it is never necessary to perform the Caesarean section on their account. Tumors in the vagina may generally be removed with safety even after the commencement of labour, and delivery happily succeed; or it may be sometimes practicable for the accoucheur

coucheur to pass his hand by the side of the tumor, to turn the child, and deliver. There are many instances where, at the commencement of labour, it was impossible to introduce a finger into the vagina; yet the parts have dilated as labour increased, and the delivery terminated happily. At other times the dilatation has begun during pregnancy, and been completed before delivery. A striking instance of this kind is recorded in the *Mem. de l'Acad. des Scienc.* 1712, of a woman whose vagina was no larger than to admit a common writing quill. She had been married at sixteen, and conceived eleven years after. Towards the fifth month of her pregnancy, the vagina began to dilate, and continued to do so till full time, when she was safely delivered.

GUILEMEAU dilated, and LA MOTT extirpated, callosities in the vagina and os tincae; when the children were successfully expelled by the force of natural labour.

Dr HARVEY relates a case where the whole vagina was grown together with cicatrices: nature, after a tedious labour, made the dilatation, and a large child was born.

M. LA MOTT\* mentions his having delivered three women, who had not the smallest vestige of an orifice through the vagina to the uterus. Dr SIMP-

SON

\* *Traité des Accouchemens*, p. 527.

SON cut through a callosity of an os uteri which was half an inch thick †, &c.

Upon the whole, tumors in the vagina, or about the orificium uteri, may be safely extirpated without danger of hemorrhagy or other fatal symptoms, and the delivery will happily succeed: And, if the vagina be impervious, the os externum shut up, or the labia grown together, the parts should be opened with a scalpel. If the os externum be entirely closed, if the cavity of the vagina be filled up, or the passage considerably obstructed by the tumors, callosity, or constriction from cicatrix, and there is no reason to suspect a fault in the pelvis, of which a judgment may be formed by the common marks of deformity, under-size, or a rickety habit; it is by much the best practice to open a passage through the vagina, and deliver the woman in the ordinary way.

If there be no defect in the pelvis, the head of the child, or any other bulky part that presents, will advance in this direction till it meets with a resistance in the soft parts: the teguments, in that case, will be protruded before the child's head, in form of a tumor, when a simple incision downwards to the perinaeum, in the direction of the axis vaginae will remove the cause of difficulty, by relieving the head; the child will afterwards safely pass, and the wound will heal without any bad consequence.

When

† *Edinburgh Med. Essays*, Vo. III.

When there is any defect in the soft parts, which prevents the access of the finger into the vagina, the head of the child may be readily felt, and the state of the parts in some degree judged of by the introduction of a finger into the anus.

III. *Lacerated Uterus* is another cause, for which this operation has been recommended. The uterus may be ruptured from the cross presentation of the child in time of pregnancy, when the uterine fibres do not readily yield to the distending cause, or from mechanical violence in attempting delivery. These cases are generally fatal; and the life of the mother can seldom be saved by the Caesarean section, after the foetus escapes through the torn uterus into the cavity of the abdomen; because inflammation and sphacelus have generally affected the parts of the uterus that sustained the pressure, previous to the rupture; if otherwise, convulsions or other fatal symptoms soon ensue, from the quantity of blood, waters, &c. poured into the cavity of the abdomen.

When the child cannot be extracted by the natural passages, tremors, singultus, cold sweats, syncope, and the death of the mother, for the most part so quickly follow, that it will at least seem doubtful to a humane practitioner, how far it would be advisable, after so dreadful an accident, the woman apparently in the agonies of death, rashly to perform another dangerous operation,

operation, even with a view to preserve the child, before he had waited till the mother recruits or expires.

If part of the child be contained within the uterus and the feet can be reached the best practice is to deliver by the orifice of the womb. When the whole foetus has escaped entirely without the uterus, the Caesarean operation is recommended as the only means of preserving both mother and child.

But if the operation on this occasion be ever allowable, it may be asked,

1. At what time should it be performed?
2. Would it not have the appearance of inhumanity, to have recourse to this expedient immediately after the uterus bursts, when the woman is seemingly ready to expire, although it be the only time when there is a chance of saving the child?

3. In most cases where this accident happens, should the Caesarean section be made, it is not highly improbable that the mother will survive so terrible a laceration? At least the uncertainty how long she may survive it, seems a considerable obstacle to the operation under such disagreeable circumstances; *ne occidisse videatur, quem fors interemit.*

IV. *Ventral Conception* is a fourth indication for this operation, These are either in the ovaria, tubes, or cavity of the abdomen, and seldom arrive at great size; or are retained, often for a great many years, with-

out

out occasioning much complaint. The issue of these conceptions has also been no less various than extraordinary : for, after having been long retained in an indolent state, abscesses or ulcerations have formed, and they have been discharged through all the different parts of the abdomen\*.

Most women feel pain and violent motion towards the term of ordinary delivery, in these cases of ventral conception ; if, therefore, the operation be ever necessary, then is the proper time to perform it. But in general, as the separation of extra-uterine foetuses from their involucra may occasion immediate death in many cases, in consequence of the vast haemorrhagy that might ensue from the non-contraction power of the parts to which they adhere ; unless they point outwardly, or excite violent symptoms, their expulsion should be universally trusted to nature.

V. *Herniae of the Uterus* are never sufficient indications to induce us to perform the Caesarean section, as the uterus is very rarely influenced in such a manner, that the orifice cannot be reached, and the delivery successfully made. Many instances are to be found among Surgical authors, where deliveries, under such circumstances, have been happily performed,

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\* *Vid.* Mangeti Bibliothec. Medicin. ; Journal De Scavans ; Memoir. de l'Acad. des Sciences ; Chapman's Midwifery ; London Medical Observations ; Dr Duncan's Medical Commentaries, &c.

without having recourse to so hazardous an expedient. MAURICEAU mentions a case, where the uterus in a ventral hernia was pushed along with the intestines above the belly, and contained in a tumor of a prodigious size; the woman, however, was delivered at the end of her time in the ordinary way. M. LA MOTTE relates the history of a woman in a preternatural labour, whose uterus and child hang down pendulous to the middle of her thigh; but whom notwithstanding, he safely delivered. And Dr RUYSCH gives a case, where the midwife reduced the hernia before delivery, although it was prolapsed as far as the knee, the delivery was safely performed, and the woman had a good recovery.

*The Position or Bulk of the Child.*—Since the practice of turning the child and delivering by the feet, and the late improvement of obstetrical instruments, this operation has never been performed on account of position, monstrosity, or any other obstacle on the part of the child merely. It will be obvious, however, that the increased bulk of the foetus combined with distorted pelvis, will render the delivery proportionally difficult and dangerous: and though we may, from a concurrence of fortunate circumstances be enabled to perform the extraction by embryulcia in a pelvis somewhat less than the dimensions mentioned in Dr KELLIE'S case formerly referred to\*,  
the

\* *Vide* page 322.

the difference in the bulk of the child may render it impracticable where the aperture of the pelvis somewhat exceeds it.

Upon the whole, when, by a careful mensuration with the fingers, the pelvis appears to be faulty to such a degree as to refuse passage to the diminished size of the child's head by embryulcia, and there is no prospect of accomplishing delivery by the new operation of dividing the symphysis pubis by incision; in other words, when it appears absolutely impossible to deliver the woman by any other means, which is to be determined by a consultation of experienced practitioners; we ought *then only* to employ the dreadful expedient of cutting into the uterus to extract the child.

That this operation, frightful and hazardous as it most certainly is, has actually been performed with success in a variety of cases, the writings of several authors of character afford the most unquestionable evidence †.

We have reason, however, to suspect, that the facts related in those histories have been misrepresented, or the event of the operation in Great Britain ought not to have been so universally fatal. For, though performed under all the advantages of the improved state of surgery, which is the boast of the present

† See the authors already quoted.

present age, the unhappy patient hath not survived it in a single instance\*. In Edinburgh the Caesarian section

\* Having been an eye-witness to the operation, and an assistant to the operator Mr CHALMERS, the last time it was performed here, as the case was circumstantially related in the last Edition of this Work, we have again thought it necessary to insert the history.

ELISABETH CLERK, aged thirty, had been married for several years, became pregnant, and miscarried in the third month; the expulsion of the abortion occasioned so severe a stress, as actually to lacerate the perinaeum. Some time after her recovery, she was irregular; afterwards had one show of the menses; again conceived; and the child, as she imagined, arrived at full time. She was attacked, on Monday the 3d January 1774, about midnight, with labour-pains; which went on slowly, gradually increasing till Saturday the 15th, when she was brought from the country to the Royal Infirmary here. Upon examination, the pelvis seemed considerably distorted; but the body was otherwise well shaped, tho' of small size. The os externum vaginae was entirely shut up; nor could any vestige of vagina be observed, nor any appearance of labia pudendorum: Instead of these, there was a small aperture at the superior part of the vulva, immediately, under the mons veneris, probably about the middle anterior part of the symphysis pubis. This aperture (which had a small process on the superior part, somewhat resembling the clitoris) was no larger than just to allow the introduction of a finger; the meatus urinarius lay concealed within it. A consultation of Surgeons was called, and the Caesarean section was determined on. Having had no stool nor voided any urine for two days, an injection was attempted to be thrown up; but it did not pass, nor was it possible

section has been performed five times; viz. twice by Dr YOUNG, once by Mr ROBERT SMITH, once by

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sible to push the female catheter into the bladder. At six in the evening, the operator made an incision on the left side of the abdomen in the ordinary way, through the integuments, till the peritonæum was exposed; two small arteries sprung, which were soon stopped by a slight compression: the wound was then continued through the peritonæum into the cavity of the abdomen; when the bladder appeared slightly inflamed, and much distended, reaching with its fundus near as far as the scrobiculus cordis. Another unsuccessful attempt was made to pass the female catheter: at length a male catheter was procured, which was, after some difficulty, introduced into the bladder; and the urine evacuated to the quantity of four pounds, high smelted and fetid. This occasioned a necessary interruption, for a few minutes, between making the opening into the abdomen and uterus; the bladder collapsing, the uterus, which before lay concealed, now came in view; through which an incision was made, and a stout male child was extracted alive; and immediately afterwards the secundines. The uterus contracted rapidly. After cleansing the wound, the lips were brought together by the quill-suture, and dressed superficially. The patient supported the operation with surprising courage and resolution; and no more than five or six ounces of blood were lost on the occasion.

Being laid in bed, she complained of sickness, and had a slight fit of vomiting; but, by means of an anodyne, these symptoms soon abated. She was affected with universal coldness over her body; which also abated, on the application of warm irons to the feet. She then became easy, and slept for four or five hours. Next morning, the 16th, about two o'clock, she complained of considerable pain in the opposite side: for which she was bled, and

by Mr ALEXANDER WOOD, and once by Mr W. CHALMERS, Surgeons. It was also performed by Mr

and an injection was given, but without effect; for the pain increased, stretching from the right side to the scrobiculus cordis; nor did fomentations seem to relieve her: her pulse became frequent, she was hot, and complained of drought. At 7 A. M. the injection was repeated, but with no better success; and eight ounces more of blood were taken from the arm. A third injection still failed to evacuate any *faeces*; the drought increased; and the pulse rose to 128 strokes in a minute. At 11 A. M. the pulse became fuller, and the respiration much oppressed. No stool nor urine passed since the operation. At 12 she was bled again, when the *fiziness* appeared less than formerly. She now took a solution of *sal Glauberi*, *manna* and *cr. tart.* at short intervals; she vomited a little after the last dose, had a soft stool, and voided a small quantity of urine. At 3 P. M. her pulse was 136; and she had another stool, when this *faeces* were evacuated: she was then ordered two spoonfuls of a cordial anodyne mixture every second hour. The vomiting now abated; the pulse became smaller and more frequent: she passed urine freely; but the pain and oppressed breathing increased. At 7 P. M. her pulse rose to 142, and became weak and fluttering; she called for bread, and swallowed a little with some difficulty; her drought was intense; the *dyspnoea* still increased. She was now much oppressed, began to *toss*; the pulse sunk, and became imperceptible: she complained of faintness; but on belching wind, her breathing was relieved, and the pulse returned, growing fuller and stronger. The pain of the side still increased; two glysters of warm water with oil were then injected without effect. At 8 P. M. the pulse became less frequent and smaller; she complained much of the pain towards the scrobiculus cordis; her  
breath-

Mr W. WHYTE Surgeon in Glasgow, October 1775 : Both mother and child died. And three times in England.

*Quaeritur*, To what cause is the unsuccessful event of this operation to be imputed ?

When it proves fatal, to what immediate cause are we to ascribe the death of the patient ?

Are lacerations of the gravid uterus, when that organ is previously in an inflamed state, along with the consequences of pressure from the foetus on the irritable viscera, *not* universally mortal ?

Why, therefore, should a recent wound through the teguments, peritonaeum, and uterus, be fatal in almost every instance \* ?

Is

breathing was much oppressed; her belly was tense, and swelled as big as before the operation; her pulse was now small and feeble; she looked ghastly; and expired a little after eight, twenty-six hours after the operation.

It is to be regretted that the relations would not permit the body to be opened.

*N. B.* From the inaccuracy of the Clerk of the Infirmary, from whom the outlines of the case were received, an extraordinary bleeding, mentioned in the Elements of Midwifery, was related by mistake.

\* About four years ago, in a case where the shoulder of the child had presented in an oblique direction at the brim of the pelvis, the labour had been permitted to go on from the morning to the afternoon; the midwife had mistaken the presenting part for

Is it nervous or uterine irritation from cutting that kills? is it internal hemorrhagy, or the extravasation

for the breech; and the pains, after a few hours, became so strong and forcing, that she expected the child to be propelled with every throë. The patient soon after became restless; tossing and delirium ensued.

In this situation I was called in. When the patient was properly secured by assistants, I passed up my hand with difficulty, and discovered a considerable rent in the uterus towards the superior lateral part of the cervix, through which the shoulder and arm of the child had escaped into the cavity of the abdomen. Every attempt to insinuate the hand so high as to reach one or both feet, with a view to bring them down and deliver, brought on an impetuous gush of blood. I was therefore obliged to deliver with the crotchet; and more readily adopted this method, as there was little reason to expect, from the history of the case, that the child was alive; it really appeared to have died the day before. After the feet and body were extracted, the first arm was readily relieved; but, in bringing down the other, though every possible precaution was employed, the wound in the uterus was increased downwards to the very edge of the os tinæ.

The placenta was removed by the introduction of the hand into the uterus, on account of flooding; and some portion of intestine reduced, which had been forced through the wound of the uterus, and protruded at the vagina almost as far as the os externum. This gave me an opportunity of examining the rupture, which I found already amazingly diminished by the contraction of the uterus.

I gave the patient an opiate, and took my leave; not expecting again to have seen her in life. She slept comfortably that night; complained for a few days of an uneasy sensation like after-pains;

fation of fluids into the cavity of the abdomen? Is it increased irritation from pregnancy, the low exhausted state of the patient along with dread apprehension? Or, are not the fatal consequences rather to be chiefly imputed, as *Dr Monro thinks*, to the access of the air on the irritable viscera?

The Doctor, after making numerous experiments on different animals, found, that

“ If a large wound into the abdomen be quickly  
“ closed and accurately stitched, the animal general-  
“ ly recovers, without symptoms of danger appear-  
“ ing: but, if the bowels are exposed for a number of  
“ minutes to the cold air, dreadful pain and inflamma-  
“ tion succeed, which generally prove fatal;” and, on  
examining the abdomen after death, he found “ effu-  
“ sion of bloody serum, and adhesion of the bowels  
“ to each other.”

He therefore has proposed, for twelve years past, in his Lectures, “ that, in performing the Caesarean  
“ operation, we should be careful that the viscera be  
“ exposed as little as possible; and that the sides of  
“ the wound should be kept contiguous by a greater  
“ number of stitches than are commonly employed  
in

on the fifth day matter in considerable quantity appeared on the cloths at the pudendum, but without much pain. The discharge gradually lessened, and her recovery otherwise was nearly as good as if no extraordinary accident had happened.

“ in wounds, in order to exclude the air from the  
 “ cavity of the abdomen \*.”

The particular method of performing the operation is described so satisfactorily by Dr MONRO, our learned and accurate Professor, in his Lectures, that we shall take the liberty to insert his own words.

“ By this operation is understood, an incision  
 “ made first into the cavity of the abdomen, and  
 “ then into the uterus, in order to extract a foetus.  
 “ If the person on whom we are to perform it has  
 “ been killed by an accident in the last month of  
 “ pregnancy, or has died of a fever, we need not be  
 “ very exact about the incision, but must make it as  
 “ quickly as possible.

“ If, however, we are to operate on a living per-  
 “ son, we ought not to attempt the operation if the  
 “ has ever on any former occasion been delivered of  
 “ a child; for that is a sure proof that the natural  
 “ opening is sufficiently large †. Even if the os  
 “ uteri be not fully dilated, it will be better for the  
 “ patient to have it dilated forcibly, than to have this  
 opera-

\* In the imperfect Edition of the Elements of Midwifery, from the inaccuracy of the language this opinion appears to have been given as my own. I readily make this acknowledgment of Dr MONRO's claim, as I should otherwise detract from his deserved praises.

† The case of the Cæsarean operation mentioned in the London Medical Observations and Inquiries, Vol. V. is an exception to the general rule; but examples of this kind very rarely occur.

“ operation performed, which is attended with the  
“ most imminent danger.

“ Next, we ought strictly to examine the state of  
“ the bones and of the soft parts, lest we imagine  
“ that the bones prevent the delivery; when, per-  
“ haps, the soft parts only may be in the fault. We  
“ may also presume, that there is a sufficient wide-  
“ ness in the bones of the pelvis if the patient is not  
“ observed to have deformity in the other parts of  
“ the body, as a deformity rarely occurs in the pelvis  
“ without rickets or a curvature in the spine; though  
“ in a few cases this may happen. But, after all  
“ these circumstances have been attended to, and the  
“ operation is determined, next let us consider the  
“ proper steps to be taken in it.

“ We first empty the intestines, the rectum, and  
“ vesica urinaria, that the patient may not be disturb-  
“ ed too soon after the operation, and that the size  
“ of the bladder may not interrupt it. We then lay  
“ the patient in a horizontal posture, that the intes-  
“ tines be not pushed down between the abdominal  
“ integuments and uterus. In making the incision,  
“ we must avoid the large arteries in the containing  
“ parts. If it were to be extended far outwards,  
“ considerable branches of the circumflex might be  
“ divided; if inwards, the epigastric: so the best  
“ place is between the recti muscles, or upon the  
“ outside of the rectus. The last place is most fre-  
“ quently

“ quently preferred, and we there readily get into  
“ the uterus. By this means, indeed, the uterus  
“ must be divided towards its side, where the vessels  
“ enter and are most considerable ; but we choose the  
“ outside of the rectus, because of the vesica urinaria  
“ being in danger of contracting inflammation from  
“ the incision. Except the danger of wounding the  
“ small turns of the intestines, there is no great diffi-  
“ culty in performing the operation ; yet several  
“ cautions are to be observed. Operators have not  
“ been aware of the causes of the danger ; and we  
“ have more favourable accounts of the operation  
“ than we ought to have. We shall find in practice,  
“ that we shall be more frequently disappointed than  
“ we would imagine from the reports of authors  
“ who have only mentioned the fortunate cases. In  
“ this city the operation has been performed five  
“ times, and always without success ; tho’ some of  
“ the women, before the operation, were in ordinary  
“ health. The great danger, I am persuaded, arises  
“ from the admission of the air, as well as from the  
“ parts divided ; and I have repeatedly found, in  
“ making experiments upon animals, that if the air  
“ were let in upon the abdominal bowels for a few mi-  
“ nutes, without any farther injury, the animal  
“ often dies, and always recovers with the utmost  
“ difficulty : And this still more readily happens if a  
“ considerable quantity of red blood be extravasated  
within

“ within the cavity, which produces a most violent  
“ inflammation. Therefore the surgeon is not to go  
“ at once into the cavity of the abdomen; but should  
“ first divide the skin and muscles, and leave the pe-  
“ ritonaeum entire until the bleeding from the vessels  
“ has entirely ceased: the danger in that way, I find  
“ is very much lessened. We then open the perito-  
“ naeum, making first a small incision, and observe  
“ if the uterus is contiguous: if it is, we divide it  
“ with caution; and the assistant, by making a mo-  
“ derate pressure, hinders the air from getting into  
“ the general cavity of the abdomen. The discharge  
“ of blood from the uterus is smaller than we would  
“ expect. We then cut the membranes, separate  
“ the placenta to extract the foetus, discharge the  
“ waters; and, as soon as the foetus and secundines  
“ are removed, the uterus contracts of itself. Then  
“ let the surgeon pass his hand into the cavity of the  
“ uterus, and with one or two fingers open the os  
“ uteri, that the blood, naturally discharging into  
“ the cavity of the uterus from the wound, may pass  
“ readily out by the vagina. We then shut the  
“ wound; and, instead of leaving an opening for the  
“ discharge of matter, we trust to absorption; for I  
“ constantly find, that a very close suture contributes  
“ to the cure; so I would sew the containing parts  
“ of the abdomen with the glover’s sitch, or inter-  
“ rupted sutures at  $\frac{3}{4}$ ths of an inch distance, making

“ the needles pass through the skin and part of the  
 “ muscles, but not within the cavity, leaving the  
 “ peritonaeum entire; or, if there is a considerable  
 “ effusion of blood and water, let us stitch all but  
 “ the under-part, introduce into it a soft tent, and  
 “ cover the whole with a compress. The patient  
 “ is to be kept on a strict antiphlogistic regimen du-  
 “ ring the cure.”

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### C H A P. III.

#### PRETERNATURAL LABOURS.

**L**ABOURS are styled *Preternatural*, “ when any  
 “ part of the child’s body, except the head,  
 “ presents, or is first felt by the finger, at the mouth  
 “ of the womb.”

We have already said, that, in the most natural position, the top of the head presents; but the feet and breech often first appear, and the child is delivered in that manner. In other cases of preternatural presentation, the position must be altered; and the child, in the language of midwifery, is then said to be *turned*.

The causes of preternatural labours probably are,  
 The motion and stirrings of the foetus, either naturally, or from shocks affecting the mother. For,  
 in

in the early months, the foetus having once altered its position, may be prevented from recovering it by folds of the chord round its body and limbs; and, in advanced gestation, if the breech should get undermost instead of the head, the child will with difficulty be restored to its proper position, as the quantity of water is constantly decreasing, and the child becoming more bulky.

The position of the child in the womb may be also influenced by its particular figure and construction; the quantity of surrounding water, the length of the chord, the manner of stretching of the womb, the shape of the basin, and a variety of other circumstances.

We can sometimes discover that the child presents in an unfavourable position, even when the labour is but little advanced.—We suspect it,

1<sup>st</sup>, If the pains be more slack and trifling than usual.

2<sup>dly</sup>, If the membranes be protruded in a long form, like a gut, or the finger of a glove.

3<sup>dly</sup>, If no part of the child can be felt when the orifice of the womb is considerably opened; or,

4<sup>thly</sup>, If the presenting part, through the membranes, be smaller, feels lighter, and gives less resistance, when touched, than the bulky heavy head.

It can with more certainty be ascertained after the membranes, are ruptured, by feeling distinctly the presenting

presenting part. If the child's stools be passed with the waters, it is a sign either that the breech presents, or that the child has been for some time dead; though there are some exceptions to this rule.

Preternatural labours are difficult of delivery, or hazardous, from,

1<sup>st</sup>, The health and constitution of the woman, and figure and dimensions of the pelvis.

2<sup>dly</sup>, The bulk of the child's body, and manner of presenting.

3<sup>dly</sup>, The time which has passed since the waters were evacuated; for, if that has been long, the womb is more strongly contracted, and the presenting part pushed on, and more firmly locked in the pelvis.

4<sup>thly</sup>, From a plurality of children; from the chord falling down before the presenting part; being entangled with its limbs; or from profuse flooding.

The variety of preternatural positions may be reduced to the following classes.

I. When one or both of the lower extremities present; as one or both feet, knees, or the breech.

II. When the child lies cross the pelvis in a rounded or oval form, with the arm, shoulder, side, back or belly, presenting.

III. One

III. One or both arms protruded before the head.

IV. Premature or flooding cases, or where the navel-string falls down double before the presenting part, and the child's life is in danger from its compression.

Each class of this general division includes a variety of particular cases. By giving a few examples of each class, a general idea of the manner of treating the whole will be formed.—It is, however, necessary to observe, that, though delivery, in some preternatural cases, may be easy, it is always precarious, and often difficult.

## C L A S S I.

*When one or both Feet, Knees, or the Breech, present.*

### C A S E I.

**T**HE simplest and easiest case of preternatural labour is supposed to be, *when the child presents with the feet*: but there is sometimes danger lest the head should be retained after the delivery of the body, which is less when the child presents double; though, even in that position, a first child frequently loses its life.

We are often able to discern the presenting part long before the membranes break, and it is of great

consequence to discover early how the child lies; but, in making the necessary examination, care must be taken not to press the finger against the membranes in time of a pain. When the presenting part is at a distance, or the position of the child appears doubtful or obscure, the woman should be shifted from her side to her back, examined in a sitting posture at the pubes where the pelvis is shallow, or on her knees. A hand is often mistaken for a foot; but the latter may be readily distinguished from the former by the weight and resistance it gives to the touch, by the shortness of the toes, and the length of the heel.

*When one or both feet present in the passage,* little more ought to be done than if the labour were strictly natural, till the orifice of the womb be sufficiently dilated, and the presenting part advanced at or without the os externum. The woman must then be placed either on her side, with the breech over the edge of the bed, and her head obliquely to the opposite side; or, on her back cross the bed, supported by an assistant in the bed to raise her head and shoulders, and an assistant at either side of the bed on a low seat, whose office is to secure the woman's feet, to separate her knees, and prevent her from shifting. When any difficulty in extracting the head may be suspected, or when the practitioner is not very dexterous in the art, the latter posture is preferable. It is also, in general, for young practitioners

oners, the best position, in all those cases where it is necessary to pass the hand into the uterus, to make the delivery by turning the child.

When the parts are thus sufficiently open, or the feet, by the force of repeated pains, at, or protruded without, the orifice of the vagina, the operator may then take hold, first of one leg, grasping it firmly above the ankle, and gently endeavouring to pull it down in the time of a pain, not in a straight line, but from side to side, or from pubes to sacrum; when the pain remits a warm cloth is to be applied to the os externum, and the return of the pain should be waited for. The other leg is then to be taken hold of and pulled down in the same gradual gentle manner with the former: by pulling alternately first by one foot then by the other, there is less hazard of injuring the uterus, than if an attempt were made to bring down both feet at once; and the passages, being thus gradually stretched, will be better prepared for the delivery of the bulky shoulders and head.

When the feet are sufficiently advanced for it, a warm cloth should be wrapped round them; which will enable the operator to take a firmer hold, and defend the child from the hazard of injury by the extraction. But the cloth should be so applied as to leave the toes exposed; for they are the proper direction for turning body. If they already point to the sacrum, the

child

child is to be brought along in the same direction, till it stops from the resistance of the shoulders. But if, instead of pointing backwards, the toes should point to the side or belly, the child's body must be gradually turned, till the belly be applied to the back of the mother, and the back of the child to the mother's pubes.

The proper time to begin to turn, is a little before the breech advances to the *os externum*. The turn should not be made all at once, but gradually; the child's body must be firmly grasped with both hands, pushing a little upwards, then turning to one side in time of the pain, carefully observing and favouring that line of direction which the child naturally inclines to take. The attempt must be repeated during every pain, till the child's body be turned round, and the face applied to the sacrum of the mother. The motions of the child's head and body do not always exactly correspond. Therefore, after the belly of the child presses against the perinaeum of the mother, a quarter-turn extraordinary is still necessary, which must again be reversed before the operator begins to extract. By that means the arm will be prevented from getting under the face, the broad shoulders will be applied to the widest diameter of the pelvis, the face will be turned towards the angle of the sacrum, and readily follow in that direction.

When the breech is entirely protruded without  
the

the os externum, the child must be taken hold of by grasping firmly with the thumbs above the haunches, and the fingers spread over the groins; the extraction must be gradually performed, moving from side to side, pressing a little downwards towards the perinaeum, and waiting for natural pains, or resting from time to time. As the belly advances, the operator must slide up his hand, or two fingers, and very gently draw down a little the umbilical cord, lest, being tense and overstretched, the circulation might be interrupted, and the life of the child destroyed, which often happens where this precaution is neglected.

After the breech is protruded, and the navel-string begins to be compressed, from the os tincae grasping it like a ring, the delivery must be conducted with all the expedition that the mother's safety will admit of. When the child is advanced as far as the breast, its farther progress is prevented by the arms going up by the sides of the head. This obstacle must be removed in this manner: The child's body ought to be supported by the left-hand of the operator, which must be passed under the breast of the child, in such a manner that the child, may rest on the palm and arm of that hand; the child must then be drawn a little to one side, that two or more fingers of the right-hand may be passed at the opposite side into the pelvis, over the back of the shoulder,

shoulder, as far as the elbow, to bring down the arm obliquely along the breast, gently bending it at the fore-arm, in such a manner as to favour the natural motions of the joint. Having then shifted hands, the other arm must be disengaged, and brought down in the same manner.

Both arms of the child being relieved, the woman may be allowed to rest a little till another pain or two follow; when, by bearing down in the time of the pain, the head will generally be forced down and delivered. But, if the woman be much exhausted, and the head does not quickly follow, the child will be lost from the pressure of the navel-string.

The pulsation of the arteries in the chord should regulate the time for extracting the head: while the pulsation is strong, there is no hazard from delay; if the pulsation be weak or languid, more especially if the chord begins to be cold and flaccid, the extraction must be quickly performed, otherwise the child will be destroyed.

The extraction of the head in preternatural labours, is often the most difficult and dangerous part of the delivery. The cause of resistance, when it does not advance, is chiefly owing to its confinement between the sacrum and pubes, when the bulky part of the head is detained at the brim, or at the lower part, by the chin catching on the sacro-sciatic ligaments. The method of delivery is to introduce two  
fingers

fingers of the right-hand (which hand and arm at the same time must support the body of the child) into the mouth, and pull down the jaw towards the breast; then applying the other hand with the fingers spread, so as to press down the shoulders, the operator must rise from his seat, and pull in <sup>the</sup> a direction from pubes to sacrum with considerable force, alternately raising and depressing the head till it begins to yield, so that, the chin being constantly pressed to the breast, the face will descend from the hollow of the sacrum: the delivery must then be finished, by bringing the hind-head from under the pubes with a half-round turn.

During these efforts, an assistant must be directed to press on the perinaeum; and, whenever the circumstances of the case will admit of it, the exertions of the operator should coincide with the natural throes of labour, by which the extraction will be greatly facilitated.

If the position be unfavourable, the face, if possible, should be turned towards the sacrum, by pushing up the head, or by pressing on the chin; if the mouth cannot be reached, the pressure should be made any where on the lower-jaw; if the difficulty arises from the folds of the chord round the legs, thighs, body, or neck of the child, these must be disengaged in the easiest manner possible. The contraction of the orificium uteri round the child's neck rarely

rarely proves the cause of the resistance, except when the feet are pulled down too early, or in premature labours, when it may be gently stretched with the fingers, and further endeavours should be delayed for some time.

If the head does not yield after repeated efforts, in the manner directed, there is a necessity for resting some time; as the head does not so soon collapse, and mould itself to the passage, in preternatural as in natural presentations. Whatever obstacle prevents it from advancing, it will still be prudent to rest for a little; and, after a proper interval, renew our exertions by thus alternately resting, and attempting to extract, the head will yield, and the child may be saved, after a considerable exertion of force has been used.

If the cause of resistance appears to be the extraordinary bulk of the head from hydrocephalus, the teguments may be bursted by the the force of pulling, by thrusting a finger through them, or by perforating the cranium with the long scissars.

If by the violent exertions employed, there is hazard of dislocating the cervical vertebrae, and separating the body from the head, the operator must cautiously desist from pulling, and wait for the contractions of the uterus, employing his exertions during the time of pains only.

If the head is of a monstrous size, or the pelvis  
very

very faulty, the former must be opened with the scissars at the basis of the skull, and the extraction afterwards performed with the crotchet.

The fingers of the operator introduced into the mouth, or pressing on the upper or lower-jaw, will be sufficient to accomplish the extraction of the head where there is no great disproportion between it and the pelvis; so that the forceps will seldom be necessary. In more difficult cases, the crotchet must be used.

Case 2. *When one foot only is protruded into the Vagina*, the other is sometimes detained by catching on the pubes, and, if easily come at, should be brought down, always observing to humour the natural motion of the joint; but, if the leg should be folded up along the child's body, or of difficult access, the attempt is not only troublesome, but dangerous, as there is hazard of tearing the uterus. It is less necessary, as the breech will be either naturally forced down by the assistance of pains, or by pulling at one leg only.

Case 3. *When one or both knees present*, the legs often cannot be brought down, till the breech be gently raised and pushed a little back into the pelvis.

Case 4. *If the feet should offer along with the breech*, it must be cautiously thrust back, while the former are secured and brought down, till the position be

reduced to a footling-case, and the delivery otherwise managed as already directed.

Case 5. *The Breech.*

The varieties of the breech are,

1<sup>st</sup>, The fore-parts of the child placed to the pubes of the mother;

2<sup>dly</sup>, To the sacrum;

3<sup>dly</sup>, To either side.

Sometimes the position of the breech may be discovered before the membranes break; but afterwards with more certainty, by the meconium of the child accompanying the waters; and by feeling the buttocks, thighs, or genitals of the child to the touch.

In whatever manner the breech presents, the delivery should be submitted to nature, till the child be advanced so far, that the feet can be laid hold of and brought down. If the fore-parts of the child be already placed towards the sacrum of the mother, nothing else is necessary but to support the child till it advances so low, by the force of the natural pains, that the feet can be readily and safely brought down.

If the fore-parts of the child be placed anteriorly or laterally to the mother, when the child is so far advanced that it can be laid hold of and wrapped in a cloth, the mechanical turns must be made, and the delivery finished, as directed in footling-cases.

There is much less hazard, in general, in allowing

ing the child to advance double, than in precipitating the extraction, by pushing up to bring down the feet, before the parts have been sufficiently dilated: a practice difficult and troublesome to the operator; painful, and sometimes dangerous to the mother; and by which the child is exposed to the risk of strangulation, from the retention of the head after the delivery of the body. If the child be small, though doubled, it will easily pass in that direction; if large, though the labour should be painful, the natural throes are less violent and dangerous than the pain occasioned, first, by introducing the hand with a view to turn; and, 2dly, by pushing up the child in order to lay hold of the feet and bring them down. If the child advances naturally, it will be less exposed to suffer; if it should not advance, there is this advantage, that the parts of the mother will be properly prepared, when the strong pains are abated, for passing the hand into the pelvis, to raise up the breech, search for the feet, bring down one or both, and deliver.

The propriety of this mode of treatment is supported by the pains being often stronger in breech-cases than in natural labour; but it cannot be followed when the mother is weak, and the pains are trifling; when she is affected with floodings or convulsions; when the child is of a very large size, or the pelvis narrow; when the umbilical chord falls down, and

is compressed between the thighs of the child, or between the child and the pelvis, and cannot be reduced above the presenting part.

The prolapsus of the navel-string generally accompanies that position of the breech, where the child presents with its fore-parts to the belly of the mother. Sometimes the chord can be reduced, and the child's life preserved: but, if the breech be far advanced, and the pains strong, it is not only difficult, but hazardous, to push up the child; who can seldom, in such circumstances, be preserved. It is better, therefore, to let the child come as it will, if there are pains, rather than hazard the more important life of the mother by attempting to push up and turn it. But, in all doubtful and perplexing cases, when there is time for it, the advice of a more skilful practitioner ought to be taken.

When the breech is so far advanced, that a finger or two can be passed under the bended thigh, as far as the groin of the child, assistance may be given with advantage, by alternately pulling, first at one side, then at the other, in time of the pain. But great care ought to be taken not to mistake the shoulder for the breech, and not to injure the child by violent pulling, or unequal pressure. Such errors have often been committed, and the consequences have been fatal.

In breech-cases, the greatest caution is necessary,  
when

when the genital parts present, lest the child should be injured by too frequent touching.

## C L A S S II.

*When the Child lies cross in a rounded or oval form, with the Arm, Shoulder, Side, back, or Belly, presenting.*

**I**N the former class, though the birth may sometimes, when the child is small, be accomplished without manual assistance; when the child lies across, no force of pain can make it advance in that position; and without proper aid, both mother and child would perish.

If a skilful practitioner hath the management of the labour from the beginning, the child may generally be turned, in the worst position, without much difficulty: but, when the waters have been for some time evacuated, and the uterus is strongly contracted round the child's body, turning will be difficult and laborious to the operator; painful, and even dangerous, to the mother. For it ought to be considered, that the great difficulty and hazard of turning, are chiefly owing to the resistance which the uterus gives; not so much to the position of the foetus. When the water, in whole, or in part, is retained, there is easy access to reach the feet and bring them down; but, in proportion as the water is evacuated, the uterine cavity becomes less spacious, and turning is

rendered both troublesome and dangerous. It was the old practice, in preternatural labours, to endeavour to make the head present; but, on account of its bulk, it could seldom be done, and the force employed in making the attempt was often attended with fatal consequences. The method of delivering by the feet is the most important modern improvement in the practice of midwifery; an improvement to which many thousands owe their lives.

When the child lies in a transverse position, the management is very simple. We must gently pass the hand into the uterus, to search for the feet, bring them down with the utmost caution, and finish the delivery as directed in footling-cases; for which purpose the following rules should be observed.

*Rules for turning the CHILD.*

1. The woman must be placed in a convenient posture, and kept steady by assistants, that the operator may be able to employ either hand, as the circumstances of the case may require.

2. Though the best posture for the operator, in general, as well as the patient, is the left side, with her breech placed over the edge of the bed, and her knees kept separate with a folded pillow, it will be sometimes necessary to turn her to her back; and in those cases where the child's feet are of difficult access, or where they lie towards the fundus uteri, the woman should be placed on her knees and elbows.

3. The

3. The orificium uteri should be enlarged so much as to admit the hand to pass freely; and the strong pains should be abated, before any attempt be made to deliver.

4. It is of great consequence to endeavour to learn the position of the child, and to attend to the shape and dimensions of the pelvis, before attempting to make the delivery.

5. In preternatural cases, every possible means ought to be used to preserve the membranes as long as possible. If they should break before the hand is introduced, and the state of the parts will admit of it, the hand should be quickly after passed; part of the water being thus retained, the operation of turning will be greatly facilitated. But, if the waters be drained off, and the uterus rigidly contracted round the body of the child, warm oil should be injected into the uterus, to lessen the rigidity of the parts, and a full dose of laudanum should be exhibited, previous to any attempt to procure delivery.

6. The hand and arm of the operator must be lubricated with pomatum, before attempting to introduce it into the vagina; the fingers must be gathered together in a conical form, and the resistance of the os externum be overcome by very slow and gradual degrees.

7. In passing the hand into the uterus, it ought

to be done in the gentlest manner, but with a certain degree of resolution and courage. The passages should be well lubricated with butter, or pomatum; the line of the vagina and pelvis carefully attended to; the movements of the operator must be slow and gradual; and thus, by giving time, the utmost rigidity in the soft parts may be overcome.

8. The hand ought to be introduced only during the remission of pain; when the pain comes, the operator should stop, otherwise there is great hazard of pushing the hand, or some part of the child through the substance of the uterus.

9. The hand should, if possible, be introduced by the fore parts of the child, as the feet are generally folded along the belly; and both feet, if easily come at, should be laid hold of.

10. In pushing back any part of the body of the child to come at the feet, the palm of the hand, or broad expanded fingers, must be used. This part of the operation should be performed always during the remission of pain, which should also be observed in bringing down the legs; but in making the extraction of the body, when the legs are in the proper line of direction, the efforts of the artist ought always to co-operate with those of nature.

11. As the breech advances through the pelvis, the child, if not already in the proper position, must

must be gradually turned with the fore-parts posteriorly to the mother.

12. Practitioners in midwifery should be cautious of giving credit to any report of the child's death; for most of the symptoms are fallacious. Children are often born alive when there is little reason to expect it: Therefore, in pushing up, bringing down the legs, or extracting the body, the child should never be treated roughly, but handled with the greatest delicacy.

13. When the hand is within the pelvis, and there is a necessity for passing it pretty high in the uterus to search for the child's feet, the proper direction is not precisely in the line of the navel, as Dr SMELLIE advises; but inclining it a little to one side, to avoid the prominent angle of the sacrum, by which more room will be gained, and less pain given to the woman; for the womb presses strongly there.

14. When the hand is interrupted in passing, by the spasmodic contraction of the uterus, we must desist from further insinuation, till the constriction of the uterus is somewhat abated.

15. If the hand cannot pass beyond the presenting part of the child to come at the feet, instead of thrusting back the presenting part with violence, it should be, as it were, first raised up in the pelvis, and then moved to the opposite side. By this means,  
diffi-

difficulties, otherwise insurmountable, may be removed, and great danger often prevented.

16. When both feet cannot readily be obtained, the foot and leg of the presenting part should be endeavoured to be first brought down. Hence more room will be procured for searching for the other foot, and the extraction will be performed with more ease and safety.

17. If the second foot cannot readily be found or brought down, the child may be extracted with the utmost safety by one foot only, provided we proceed slowly in the operation.

18. When the foot or feet begin to protrude without the os externum, let them be covered with a soft cloth, and the advantage of the natural pains improved to assist the extraction.

19. In all preternatural labours, when the child is delivered as far as the breech, the stricture of the navel-string should be removed, by gently drawing it down a little, as already directed.

20. As the breech advances towards the os externum, the proper means for guarding against laceration of the perinaeum must be attended to.

21. The arms are to be relieved, and the head extracted, in the manner already directed in footling-cases.

22. Children delivered by the foot, are not only often still-born, but the body is sometimes separated

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ted from the neck, and the head left behind in the cavity of the uterus ; an accident which can only happen by the rashness, negligence, or unskilfulness of the practitioner.

The causes chiefly are, *1<sup>st</sup>*, The putrid state of the child's body in consequence of its death ; *2<sup>dly</sup>*, The neglect of the operator to make the proper turns when extracting the body ; *3<sup>dly</sup>*, The narrowness of the pelvis, or bulk of the child's head.

To prevent it when the child's body is putrid ; the operator should never attempt to extract the head till two fingers be introduced into the mouth ; and by pulling down the jaw, and pressing on the shoulders, while an assistant presses gently on the woman's belly, and the woman herself bears down in the time of a pain, the extraction may generally, unless when the pelvis is narrow, be effected.

23. If the head should be actually separated and left behind in the womb, and cannot be extracted by introducing two fingers into the mouth and waiting for the assistance of pains, and the forceps should fail, the crotchet must be used. The method is to keep the head steady by the pressure of an assistant on the woman's belly, the head is opened with the scissars, and extracted with the crotchet according to the rules already given.

By attending carefully to the above rules, laceration of the uterus, floodings, convulsions, inflammation,

mation, and their consequences, may be prevented, and the child's life often preserved, even when it presents in the most awkward position.

We proceed to consider a few particular cases

Case I. *The Arm presenting.*—This position occurs frequently. It is of some consequence to form a general notion how the child lies, before the operator sits down to deliver. The right-hand, by a little attention, may be readily distinguished from the left, if we lay hold of the child's hand, in the same manner as in shaking hands.

It is often in the power of a skilful practitioner to prevent the hand from coming down, or to reduce it when it protrudes. But, if the arm be forced into the passage so low that the shoulder is locked in the pelvis, it is needless to give the woman the pain of attempting the reduction, unless when the head can be made to present, as the hand of the operator can be passed into the uterus by the side of the child's arm, which will of course return into the uterus, when the feet are brought down into the vagina. As the head, in this case, cannot easily be made to present ; in order, therefore, to make the delivery by turning the child, the hand and arm of the operator, well lubricated, must be conducted into the uterus by the side of the child's arm, along the breast and belly of the child, towards the opposite side of the pelvis, where the head lies. If any difficulty occurs in coming at  
the

the feet, the hand already introduced must be withdrawn, and the other passed in its stead. If still the hand cannot easily be pushed beyond the child's shoulder and head, the presenting part must be gently raised up, or cautiously shifted to a side, that one or both feet may be taken hold of, which must be brought as low as possible, pushing up the head and shoulders, and pulling down the feet, alternately, till they advance into the vagina, or so low that a noose or fillet can be applied; and thus, by pulling with the one hand by means of the noose and pushing with the other, the feet can be brought down, and the delivery finished in the most complicated and difficult cases.

The method of forming the noose is, by passing the two ends of a piece of tape or garter through the middle when doubled; or, if the garter be thick and clumsy, by making an eye on one end, and passing the other extremity through it. This must be mounted on the points of the fingers and thumb of the hand of the operator, who must take hold of the child's foot, slip it over the foot and ankle, and secure it by pulling at the other extremity.

Case 2. *The Shoulder.*—Great care ought to be taken that it may not be mistaken for the buttock. The shoulder will feel harder and more bony than the full thick fleshy hip; a mark which may be taken along with the others formerly mentioned in Breech-cases.

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Though

Tho' the child should originally present with the shoulder, when the orificium uteri is dilated, the arm if not prevented, may readily be forced by the repeated efforts of the labour-throes into the passage. In proportion as the presenting part advances, and the shoulder becomes locked in the pelvis, delivery by turning will be more difficult and hazardous.

Except the child be of a very small size, and the hand pressed close to the side of the head, it is impossible for the head and arm to pass together; it is, therefore, cruel and barbarous to pull the arm in order to deliver the child in that way. The arm has been often torn from the body, and the mother has died in the attempt.

Case 3. *The Side*.—This is discovered by feeling the ribs.

Case 4. *The Back*.—This is discerned by feeling some part of the spine or back bone.

Case 5. *The Belly*.—It is known by the soft yielding substance of the part, and by the falling down of some portion of the umbilical chord.

THESE three presentations, viz. the *side*, *back*, and *belly*, more rarely occur, as the uterus will with difficulty admit of such positions.

When any of these parts do present, they seldom advance much beyond the brim of the pelvis, and the child is in general as easily turned as in other presentations which more frequently occur.

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The belly, from the difficulty with which the legs can be bended backwards, unless the child be flaccid, putrid, or before the time, will very seldom directly present; if it does, it will be early and easily discovered by the prolapsus of the chord, and there will be no difficulty to come at the feet, and deliver.

The rule in all these cases is, to insinuate the hand into the uterus, in the gentlest manner possible, when the state of the parts will admit of it, to search for the feet, bring them down, and deliver, agreeably to the directions already given for that purpose.

### C L A S S III.

*One or both Arms presenting, and the Head following nearly in the same direction.*

**T**HE most difficult and laborious of the preternatural labours occur,—*When the child lies longitudinally in the uterus, with the arm or shoulder presenting, and the head more or less over the pubes, or resting on one side, at the brim of the pelvis, the feet towards the fundis uteri, the waters evacuated, and the uterus closely contracted round the child's body.*

When the arm protrudes in this manner, it ought, if possible, to be reduced, and the head brought down into the pelvis; for it is often equally difficult and dangerous to deliver by the feet, and sometimes utterly impracticable.

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A skilful practitioner, having the management of the delivery from the beginning, will often be able to prevent the protrusion of the arm, which ought to be attempted as soon as possible after the rupture of the membranes. If he fails, and the arm should be forced down, the earliest opportunity should be taken to reduce it. If successful, it will prevent much future trouble; it will be a happy circumstance for the mother, and may be the means of preserving both her life and that of the child. With this view, when the position of the woman is adjusted, the hand of the operator, well lubricated, must be insinuated thro' the vagina into the uterus, conducted by the child's arm, till it reaches as far as the axilla or shoulder. The shoulder must then be raised up, and shifted, as it were, obliquely, to the side of the pelvis, opposite to that to which it inclines. By this means the position of the child will be some-what altered, and the arm drawn up within the vagina, so that it will be afterwards no difficult task to reduce it completely. But, should this method fail, an attempt may be made to push up the fore-arm at the elbow; and, in bending it, great care must be taken to avoid over-straining, or dislocating the joint. These attempts must only be made in the intervals of pain: when the pain recurs, the operator ought immediately to desist; for, by pushing in time of the pain, or in an improper direction,

rection, the uterus may be torn, and the most fatal consequences soon ensue.

In whatever manner the reduction of the child's arm shall be accomplished, if any method proves successful, it must be retained in the uterus by the hand of the operator, till the child's head, by the force of the next pain, fills up the pelvis, and prevents its return; otherwise the arm will be protruded as often as it is reduced.

But, if the orificium uteri be not sufficiently opened to admit of the reduction of the protruding arm with safety; if, as the arm advances, the head reclines to one side of the pelvis, the throes of labour are violent, and the intervals short; it would then be as dangerous to the patient as difficult to the operator, to attempt delivery by manual exertions; for the spasmodic contractions of the uterus counteract every artificial effort; and if much mechanical force be used, the uterus is in hazard of actual laceration. In these circumstances, regardless of the anxiety of the patient, or the importunities of the attendants, the operator should desist for some time from further efforts; a large dose of liquid laudanum should be given, as from 50 to 70 gutts; and when the parts are sufficiently dilated, and the strong forcing pains abated, his attempts should then be renewed, either to reduce the arm, or insinuate his hand beyond it to come at the feet, bring them down,

and deliver. If these attempts should fail, he may endeavour to alter the position of the child, by fixing a noose on the arm, and pulling by it. More easy access may be then obtained to the anterior parts of the child, by which the hand can be conducted to the feet. But, if every method should prove ineffectual either to reduce the arm or bring down a foot, and the woman's life is in danger, the head of the child, if it can be reached, must be opened; after a proper interval, a crotchet introduced; and the extraction made by pulling at it and the protruded arm.

Should the head be without reach of the scissars, the crotchet must be fixed on the trunk or thorax, with a view to bring down the breech or feet; by securing a firm hold of the arm, and pulling by the crotchet, the delivery must, in that manner, be accomplished; a mode of practice which should only be had recourse to when the pelvis is faulty, or the patient's life in immediate danger.

IN the longitudinal contraction of the the uterus, when an arm presents, and the shoulder is advanced in the passage, so that the feet cannot easily be come at, Dr DENMAN advises "to pull the body lower  
 " down by the arm, and the difficulty will be lessened or removed." "There is, happily (he adds),  
 " no necessity of turning the child in these circumstances; for it will be born by the effect of the  
 " powers

“ powers of nature only. In such cases the child  
 “ does not come double, but the *breech* is the first  
 “ part delivered, and the *head* the last, the body turn-  
 “ ing upon its own axis.”

He adopts this opinion from four cases which occurred in his own practice, and several similar histories related by others ; in all which, however, the child was dead.

He therefore infers, “ That, in cases in which  
 “ children present with the arm, women would not  
 “ necessarily die undelivered, tho’ they were not as-  
 “ sisted by art.”

He concludes his observations with this important remark.

“ The benefit we are to derive in practice from the  
 “ knowledge of this fact is, that the custom of turn-  
 “ ing and delivering by the feet, in presentations  
 “ of the arm, will remain necessary and proper in all  
 “ cases in which the operation can be performed with  
 “ safety to the mother, and give a chance of prefer-  
 “ ving the life of the child ; but, when the child  
 “ is dead, and when we have no other view, but  
 “ merely to extract the child, to remove the danger  
 “ thence arising to the mother, it is of great impor-  
 “ tance to know, that *the child may be turned sponta-  
 “ neously by the action of the uterus* \*.” Dr

\* See Dr DENMAN’S Aphorisms respecting the Distinction and Management of Preternatural Presentation.—A small syllabus which contains some of the most important practical rules of the art.

Dr DENMAN's remark is new to me. In a case where the powers of nature have been usually considered as desperate, it is new, perhaps, only because the practitioner has thought it useless to wait for them. But though curious, as it shows what nature in her struggles can perform; and though surprising, as it apparently contradicts the laws of motion; it seems to me unnecessary, as in the numerous arm-presentations which I have attended, the child has for the most part been preserved, and the woman has seldom suffered any material injury from the delivery. I have therefore continued to practise the method which I have just recommended; and, in the most intricate presentations, have generally succeeded in making the delivery by fixing a fillet on the arm, and altering the position in the manner mentioned, when every other method had failed. I have never yet known a case to occur where the pelvis was tolerably proportioned, in which I could not either obtain access to the feet to deliver by turning, or reduce the arm and bring down the head; and have, in several cases, successfully turned where the pelvis was considerably distorted\*.

It

\* In presence of the Gentlemen who attended my Lectures last summer, I delivered a woman in the public lying-in ward, Royal Infirmary; the circumstances of the case were as follows.

The arm of the child presented, and had been in the passage,  
with

It may be necessary, however, to state the principles of this operation, that we may be aware how far to trust the unassisted efforts of the constitution.

The longitudinal contraction of the uterus, is one of those blind and indiscriminate attempts which nature sometimes makes to free herself from a burden. When her powers are exhausted, these efforts are diminished, and the uterus is relaxed. In these circumstances, then, if we can fix the arm, the body will of itself turn as on an axis; and the *heavier* part, or the breech, will come downward and be delivered: The arm is *fixed* by drawing down the shoulder; but it will be obvious, that the natural falling down of the breech will immediately draw it back again; and it is in this way that the child does not *ultimately* come down double. This operation can be easily imitated on machinery, if the aperture is conical to fix that part which represents the arm; and it is in this way clear, that the contradiction to the laws of motion is apparent only.

In the manner we have just stated, this mode of delivery

with the waters drained, from the preceding evening. The pelvis was considerably distorted, and the crotchet had been used in her former deliveries. The woman is of an under-size, of a feeble constitution, and the passages were so tight as to cramp the hand when introduced into the pelvis. By gradual stretching, and gentle insinuation, I with some difficulty reached a foot, and accomplished the delivery without the assistance of any instrument.

livery may seem to be preferable; but various circumstances diminish its advantages. Dr DENMAN has very properly limited it to the delivery of a dead child, and we may add a well-proportioned pelvis: but, even there, we exhaust the powers of nature, without an adequate advantage; especially if we reflect, that, in this exhausted state, an inconsiderable increase of the usual discharges may prove fatal.

These facts may, however, teach us, not to attempt the extraction by turning too early; for by a little delay till the strong pains are abated, it will be more practicable, and my success has fully confirmed its safety.

*When both arms present*, the delivery must be conducted much in the same manner as when one only presents. The former case is nearly as easily managed as the the latter, as the head seldom advances far in that position, being locked in the pelvis, as it were by two edges; so that the arms can either be reduced, with a view to bring down the head, or there will be easy access to come at the feet, to bring them down and deliver\*.

## C L A S S

\* During an extensive practice, I have only seen two instances in which *both arms* presented; and they occurred in Twin Cases.

## C L A S S I V.

*Method of turning the Child while the Membranes are whole, or soon after their rupture.—Method of Delivery in Flooding Cases, and when the Navel-string presents.*

**W**HEN the membranes remain entire till the soft parts of the mother are so much dilated, that the hand of the operator can readily find admittance; or when the hand can be passed within the uterine cavity, immediately after the membranes break, so that great part of the water may be retained; the delivery may be accomplished, in the most unfavourable cases, with ease and safety. But, when the waters have been long evacuated, and the uterus is rigidly contracted round the body of the child, the case will prove laborious to the operator, painful to the mother, and dangerous to her and the child.

When there is reason to suspect a cross-birth, which can often be known, either by feeling the presenting part through the membranes or by some of the signs already mentioned, the woman should be managed in such a manner that the membranes may be preserved as long as possible; for this purpose she should be kept quiet in bed, and placed in that posture least favourable for straining, or the exertion of force, in the time of a pain. She should be touched

as seldom as possible, till the orificium uteri be sufficiently dilated. She should then be placed in a proper position for delivery, that the hand of the operator may be gently insinuated in a conical form, with the fingers gathered together, through the vagina into the uterus. The hand must be passed on the outside of the membranes between and the uterus, in a direction towards the fundus. The membranes may then be broken, by pinching them between a finger and thumb, or by forcibly thrusting a finger against them in time of a pain. The hand must now be directed where the feet may reasonably be expected to lie; one or both of which must be taken hold of, and brought down. If the membranes should be ruptured in the attempt, the hand must be passed up into the uterus as expeditiously as it can be done with safety. Part of the waters being thus retained by the introduced arm, the operation of turning will be greatly facilitated.

If the membranes should be ruptured before the orificium uteri be sufficiently opened to allow the hand to pass, even in these circumstances, it is necessary that the woman be kept quiet in bed, and the same precautions should be used as if the membranes were entire; for the retention of a small quantity of water is of great consequence in turning.

After the hand is introduced into the cavity of the uterus, if the placenta should be found to adhere at  
that

that side, and to interrupt the hand of the operator from passing, it must be withdrawn, and the other hand be introduced at the opposite side.

*Method of Delivery in Flooding Cases.*

FLOODINGS, as already explained, proceed from a separation of some portion of the placenta, or spongy chorion, from the internal surface of the uterus. But the most dangerous haemorrhagies arise from a separation of the cake when attached to the cervix, or over the orificium uteri\*.

Floodings, before the 7th month of gestation, may be often checked by the management formerly directed; after which period, however, there is always considerable danger. And, as it is sometimes necessary to deliver, even when no part of the placenta can be reached with the finger, the constant attendance of the practitioner is requisite, and the utmost judgment to catch the proper time of proceeding.

There is hazard in attempting delivery too early, while the os uteri is close and rigid. When the woman, from loss of blood, is somewhat sunk, the uterine orifice is more relaxed and dilatable. The time can only be determined by constantly staying with the patient, and examining the state of the os uteri occasionally. In so critical a situation, the

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neglect

\* See the article *Flooding* in Pathology of Parturition.

neglect of half an hour, or less, may be fatal to the mother and child.

The best practice in this case is, first, to wait on; giving opiates at proper intervals, and keeping the woman quiet and cool. If possible, delivery should never be attempted till pains occur, and the membranes begin to protrude. Pains may be brought on, or increased, by gently irritating the os tincae. The membranes may then be broken by pushing a finger, or the catheter, thro' them; the water, gushing out, the womb contracts and stops the bleeding. We can now safely wait for six, twelve, or twenty-four hours, if necessary, till the pains recur, and then deliver according to the presentation. But, if the flooding should not then abate, or if the position of the foetus be unfavourable, the hand must be passed into the uterus, the feet of the child taken hold of and brought down. The uterus now contracting, soon stops the flow of blood, or prevents an excessive discharge: therefore, after the feet are brought down, the body of the child should be extracted by very slow and gradual efforts; lest, from too sudden evacuation of the uterine contents, fatal faintings or convulsions might ensue.

Flooding, from the *attachment of the placenta at the orificium uteri*, will be sufficiently indicated by its alarming appearance and rapid increase, and by the soft pappy feel of the cake to the touch; though, when

when there is little dilatation of the os tincae, it will be necessary to introduce the whole hand into the vagina, in order, more certainly, to be able to feel the placenta with a finger introduced within the os internum.

In these unhappy cases, there is no method of saving the woman, but by immediate delivery.

We are sometimes obliged to pass the hand at an opening made through the body of the placenta; but, if possible, the hand should rather be insinuated at the side of the cake, where the least portion is attached, to go into the uterus, break the membranes, search for the child's feet, bring them down, and deliver.

In some instances, before the orificium uteri can be sufficiently opened to admit the hand of the operator to pass, the whole cake will actually be disengaged and protruded; but the separation and expulsion of the placenta, previous to the birth of the child, is, for the most part, fatal to the mother.

Much of our success, in these alarming cases of flooding\*, will depend on *staying with the woman*, and trying the *dilatability* of the orificium uteri from time  
to

\* See Mr RIGBY's valuable Treatise on this Subject already referred to.—See also Dr LEAK'S observations on the nature and Treatment of Uterine Hæmorrhagies before and after delivery. Practical Observations on the child-bed Fever, &c. 5th Edition, p. 258.

to time : for, after she is sunk to a certain degree, the muscular fibres of that organ lose their contractile power, the flow of blood increases, and, if neglected, she soon dies ; so that the presence of the operator can only save her.

In cases so strictly critical and hazardous, two practitioners should therefore be called, for *one* ought to be in constant waiting.

*Prolapsed Funis*—A pressure on the umbilical cord, perhaps for ten minutes, by interrupting the circulation, will be sufficient to destroy the life of the child. A coldness and want of pulsation in the cord, is the most infallible sign of the child's death ; therefore, if any portion of the former be protruded before any bulky part of the child, there is hazard of the loss of the child, unless the labour be soon over. The danger can only be prevented by re-placing the cord, and retaining it above the presenting part of the child, till it be so far protruded by the force of the pain, as to prevent the return of the cord ; or, the child must be turned and delivered by the feet, (for the forceps cannot be used till the head be well advanced in the pelvis.) But it is often difficult to reduce the cord, and much more so to turn the child. For, if the pains be strong and frequent, the consequence of such attempts may be fatal to the mother.

If the child be of an ordinary, or small size, and the pelvis be well formed ; if the labour goes on quickly,

ly, and especially if the woman had formerly good deliveries; the child may yet be born alive. If, on the contrary, the child exceeds the ordinary size, or the pelvis comes short of its usual dimensions, turning would prove a dangerous operation to the mother, and there is little prospect of saving the infant by it.

The best practice, therefore, is to take the earliest opportunity that the circumstances of the case will admit of, to reduce the cord, by placing the woman in a proper position, so that the hand of the operator may be carried up, in the absence of pain, into the pelvis, and the cord entirely reduced. If this method fails,—and it cannot be practised when the pains are strong and frequent, or the head wedged in the pelvis, no farther attempts should be made; and the child should be allowed to be propelled by the natural pains, or protruded so low that the forceps can be used.

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## C H A P. IV.

*Plurality of Children; Monsters; Extra-uterine Fœtuses.*

### I. PLURALITY of CHILDREN.

**A**LTHOUGH women commonly produce one child only at a birth, yet the uterus is capable of containing several.

Cases of twins often occur, of triplets seldom, of four children very rarely\* ; and there are few instances of five foetuses at one birth, notwithstanding the fabulous histories which have been related by credulous authors.

It is very difficult to judge of the existence of twins or triplets, from appearances previous to delivery ; for all the signs enumerated are fallacious.

When there is reason to suspect that there is another child, after the delivery of the first, it ought to be ascertained by passing a finger within the os uteri ; or, if that is insufficient, by the introduction of the hand.

The symptoms chiefly to be trusted, after the birth of one child, are,

1<sup>st</sup>, The diminutive size of the child, and the waters being disproportioned to the distention of the gravid uterus.

2<sup>dly</sup>, The umbilical chord, after it is divided, continuing to bleed beyond the usual time.

3<sup>dly</sup>, The recurrence of regular labour-pains.

4<sup>thly</sup>, The retention of the placenta.

5<sup>thly</sup>, The abdominal tumor not sensibly diminished between the stomach and umbilicus.

All

\* Three years ago I attended a woman in the Grass Market, who brought forth *four children* at a birth between the 6th and 7th months. Three were born alive, and one was dead. This is the only instance of the kind ever known to have occurred in Edinburgh.

All these symptoms are seldom united; and several of them are, by themselves, fallacious: for the placentae of twins are often distant from each other in the uterus, and so loosely connected to it, that one may entirely separate before the second child be born; so that labour-pains will sometimes cease for two or three days, and there is the same interval between the births of the children.

It is necessary, therefore, to attend to the usual diminution of the belly; and, in doubtful cases, to introduce the hand into the uterus.

The position of twins or triplets is commonly that which is most commodiously adapted to the uterus, and which will occupy the least room. One child often presents naturally; the other, or others, by the feet or breech; sometimes both, or all, present naturally: at other times, the position is cross: so that the delivery must be regulated by the presentation.

With regard to the management, opposite sentiments have been entertained.

In some instances, natural pains, after the delivery of the first child, soon come on. The membranes will then be quickly forced down, and the presenting part of the child may be readily felt through them; but, if the presentation of the child should be doubtful to the touch, the practitioner ought immediately

to place the woman in a proper position, and gently insinuate his hand, by the side of the membranes, into the uterus, and examine how the child lies. If the head or breech present, it is only necessary to break the membranes, withdraw the hand, and leave the child to be expelled by the natural pains. If the feet are felt through the membranes, let them be broken, the feet taken hold of, and brought into the passage. The delivery must be otherwise managed as directed in footling-cases, carefully observing not to neglect the proper turns in extracting the body.

If any other part than the head, breech, or feet should present, the latter must be searched for through the membranes, and brought down into the passage. The feet may, by a dexterous operator, in most cases, be brought down without breaking the membranes; but, if they should be ruptured in the attempt, the feet must then immediately be taken hold of, gently brought down, and the delivery finished as formerly directed.

When the uterus is very much distended, it, in some degree, loses its power of contraction. From this cause the pains are often less strong and forcing, and the labour is more tedious, in twins and triplets, than when there is but one child; hence a considerable length of time, as several days, in some instances, intervenes between the birth of the different children. In this interval, the woman is apt to suffer  
from

from impatience and anxiety. Floodings frequently come on; and the labour is more painful and hazardous, in proportion as the time of delivery is protracted. It may therefore be recommended to practitioners as a general rule, If labour-pains do not naturally recur soon after the birth of the first child, to place the woman in a proper position, gently pass the hand into the uterus, break the membranes, and manage the delivery according to the presentation.

As this subject has given rise to a variety of opinions among authors, we shall add, for the instruction of young practitioners, a few rules, which include the whole directions necessary for the management.

*Rules for Delivery, in cases of Twins,  
Triplets, &c*

1. If a second child be suspected, let a ligature immediately be made on the end of the umbilical cord next the mother, lest the two placentae being connected, the cord should continue to bleed.

2. Having waited the usual time, as if for the separation of the placenta, and it appears to adhere firmly, let a finger be passed up by the side of the cord to examine whether there is another set of membranes.

Some part of the former water may be retained within a fold of the membranes, and, protruding at the orifice of the uterus, may be mistaken by an inexperienced

experienced practitioner for a second set of membranes : but the distinction may readily be made by moving the finger round and round the protruding bag ; or, if it be still doubtful, the hand must be passed into the uterus.

When it is ascertained that there is any other child the accoucheur should stay with his patient, as if waiting for the separation of the placenta, and carefully observe lest a flooding should occur.

4. A gentle compression ought to be made on the abdomen, which must be gradually tightened as the uterine tumor subsides.

5. If pains soon come on, and the child presents in a position in which it can advance without manual assistance, let it be expelled by the natural pains. If it comes double, or by the feet, when the breech is advanced as far as the os externum, let the proper turns be carefully attended to.

6. If labour-pains do not occur within the space of a few hours after the delivery of the first child, it will then be advisable to place the woman in a convenient position for delivery, to pass the hand into the uterus, break the membranes, and otherwise manage the delivery as already directed. For if pains do not soon come on the woman may go on undelivered for several days, unless the membranes be broken. When the waters are evacuated, the uterus contracts and the child quickly advances.

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If the pains be trifling, and have little effect in protruding the child, the same management will be necessary.

7. If, from the very small size of the first and second child, there may be reason to suspect that any other yet remains; after having waited about half an hour for the separation of the placenta, without effect, let the hand be again passed into the uterus, and if a third set of membranes be discovered, let them be broken, and the delivery managed as already directed. If there be no other child, let the placentae be disengaged and extracted. But if they adhere firmly, it is better to keep the hand in the uterus, till by its contraction they are gradually separated and disengaged rather than to attempt it by force.

8. The placentae of twins and triplets are often connected, and adhere at the edges, though each child has its distinct membranes and water.

When they adhere at the sides, they separate, and are expelled together, after the birth of the last of the children. But, when they are attached in different portions to the uterus, the placenta frequently follows the birth of that child to which it belonged, before the second labour ensues.

9. When another child is discovered, no attempt ought to be made to remove the placenta, before the delivery of the remaining child or children; such attempts would expose the woman to the hazard of flooding

flooding, which might end fatally before the uterus could be emptied of its contents.

10. The placentae of twins, or triplets, generally separate easily, provided that time be given for the contraction of the uterus. Each cord should be cautiously pulled, sometimes alternately, sometimes pulling by both, or by all at once, desiring the woman to assist gently by her own efforts.

When the bulky mass advances as far as the os tincae, the resistance occasioned by the contracting orifice must be removed, by the introduction of a finger or two within the passage, to bring down the edge: the substance of the cake is then to be grasped firmly, and the whole entirely extracted.

When they adhere in distinct portions, they must be separated, one after another and removed.

11. If flooding should occur, or any of those obstacles to expulsion, formerly mentioned, the hand must be conducted into the uterus, and the separation and extraction of the placentae accomplished agreeably to the directions already given.

## II. MONSTERS.

THESE are of various sizes and forms; and, unless very small, the presentation favourable, the woman well made, will prove the cause of a difficult and troublesome delivery. Sometimes a child is monstrous, from a preternatural conformation of parts; such

such as a monstrous head, thorax, abdomen, &c. at other times, there is a double set of parts: as two heads, two bodies with one head, four arms, legs, &c. But such appearances very seldom occur in practice; and, when they do, the delivery must be regulated entirely according to the circumstances of the case. A large head, thorax, or belly, must be opened. If two bodies, united, or one body with supernumerary limbs, form too bulky a mass to pass entire, they must be separated. If the posture be unfavourable, it must be reduced when practicable; otherwise the extraction must be made with the crotchet in the best manner the particular circumstances of the case will admit of.

### III. EXTRA-UTERINE FOETUSES.

When nature points it out, by a local inflammation or abscess, the foetus, or bones of the foetus, may be cut upon and extracted; but otherwise the Surgeon's art will not avail, and every treatment is improper\*.

\* Vide *Ventral Conception* p. 334.

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## A P P E N D I X.

THE greatest part of the preceding work, in the former Edition, having been printed before Dr Osburne's Treatise came into my hands, I then took the earliest opportunity to acknowledge the polite and respectful manner with which that gentleman expressed his sentiments on some subjects in which we seem to have differed in opinion.

The first attempt of an author, in the infancy of practice and teaching, must be rude and imperfect: frequent reflection from reading and experience, enable him to detect the errors of others, and to guide his own steps with caution and safety. The Elements of Midwifery were originally intended as a very short syllabus for the use of the Author's students only. It was begun and carried on in a hurry, having been actually written and published in little more than two months. The supplement, designed to supply the omissions in the text, shows that the Author was sensible of the deficiency of the former part.

As our opinions, at present, more nearly coincide, it is unnecessary to trouble Dr Osburne or the Public

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lic with any pompous, laboured reply: I shall, therefore, confine myself to a few observations on those remarks in his publication, in which I myself, only, am concerned.

1. Dr Osburne (page 69,) condemns the practice of fixing the crotched *somewhere on the outside of the skull*. This, however, was the practice, even in London, when I attended an eminent teacher not a great many years ago. It was the practice of Dr Smellie; and more lately of Dr Young; late professor in this university, an operator as skilful and successful as any of the former. The construction of that instrument, plainly shows, that it was originally intended to be fixed *on the outside of the skull chiefly*. The concavity of the blade is exactly adapted to the convexity of the child's head. But I have already observed, in this volume, that the crotchet should be fixed in the *basis of the skull*; though there are some cases in which it may still be proper sometimes to fix it on the outside. An experienced operator can, however, decide on this point, after he has maturely considered the circumstances both of the presentation and pelvis.

2. The calculation of the successful cases, in which the Cæsarean operation was performed, were taken from old authors, exclusive of unfortunate cases in Britain; and the author candidly acknowledges the mistake into which they had led him. He  
cannot

cannot avoid, however, expressing his surprise, that Dr Osburne should have so far misunderstood his meaning, as to insinuate, that he would ever recommend the operation to be performed on the living subject, except in those rare cases where it appeared absolutely impossible to extract a child through the aperture of the pelvis \*: And to a deficiency of space in

\* “ When the hand of the operator cannot be introduced within the pelvis; or, in other words, when its largest diameter does not exceed one inch, or one inch and a half: this conformation is perhaps the only one which renders the Caesarean operation absolutely necessary. Happily, however, such a structure very seldom occurs in practice; and, when it does, the Accoucheur will readily discover it by attending to the following circumstances, and to the common marks of a narrow pelvis. Where the capacity of the pelvis is so strait as not to admit any part of the child's head to enter, nor of two fingers of the Accoucheur's hand to conduct proper instruments to tear, break down, and extract the child piece-meal, in this case recourse must be had to the Caesarean section; an expedient, though dreadful and hazardous, that will give the woman and child the only chance of life; and which, if timely and prudently conducted, notwithstanding the many instances wherein it has failed, may be performed with great probability of success.” *Elements of Midwifery*, p. 241.

And, lest he had not formerly been sufficiently explicit, the following caution is subjoined in the Supplement.

“ The absolute impracticability of extracting a child through the aperture of the pelvis, is perhaps the only circumstance that justifies

in the *bony cavity alone*, he expressly confines it; viz.  
 “ where the transverse diameter, at the brim, mea-  
 “ sures from one to, not exceeding, two inches.”

His motives for mentioning the cases in which the operation had been performed, were to show from authentic records, that however formidable and hazardous, it is certainly practicable; and to regret the imperfection of an art which obliges us, *sometimes*, to have recourse to the dreadful alternative of witnessing the unsuccessful efforts of Nature in her last feeble struggles; or by a desperate effort of the limited powers of surgery, offer our assistance.

Dr Osburne asserts, “ that a child can be extracted  
 “ by embryulcia, through a pelvis whose aperture  
 “ from pubes to sacrum measures only one inch  
 “ and a half; dimensions much less than what have  
 “ invariably been supposed to require the Caesarean  
 “ operation, even in the latest and best books\*.”  
 And by this means he hopes to diminish, if not supercede, the necessity of the Caesarean section, by substituting the crotchet in its stead. He goes further, and endeavours to prove, (p. 251 and 252,) that

ties the performance of the Caesarean operation on the living subject; which ought never to be had recourse to in cases of diseases, or original mal-conformation of the soft parts of generation, when there is no suspicion of deformity of the bones.” *Elements of Midwifery*, p. 292.

\* See Dr OSBURNE'S Treatise on Laborious Parturition, p. 251.

“ that the head of a mature foetus may be safely  
 “ extracted with the crotchet, its volume having  
 “ been previously lessened, wherever there is a space  
 “ equal to one inch and a half from pubes to sacrum :”  
 And asserts, “ that, in these circumstances, deli-  
 “ very may be *always* effected with safety to the  
 “ mother.’

The world is infinitely obliged to this author for the uncommon pains he hath taken to show “ what  
 “ are the smallest possible dimensions of the pelvis  
 “ through which a child, with its head opened,  
 “ can be extracted, with safety to the mother, by  
 “ means of the crotchet.” I hope, and earnestly wish, for the honour of the profession, and the credit of Dr Osburne, that his data may be well-grounded, and that the result may prove adequate to his expectations.

But, though the dimensions of the pelvis may be capable of mensuration with mathematical precision, yet the difference in the bulk and solidity of childrens heads cannot so easily be ascertained; nor can I entirely agree with Dr Osburne when he says, (p. 27,) “ We are in possession, however,  
 “ of the means of determining it with exactness  
 “ sufficient to direct our practice in the safest and  
 “ best manner.”

The case of Elizabeth Sherwood, (p. 73,) shows the possibility of performing delivery with the crotchet

chet, in circumstances hitherto deemed unfavourable and desperate. But, in a pelvis of a similar construction, various causes may concur to disappoint our views, and baffle our attempts; or, from the obstacles that necessarily occur, delivery must always be precarious in the consequences; and this will diminish the value of the advantages we might otherwise expect to derive from this important discovery.

To conclude: Though we allow the whole of Dr Osburne's postulata, it must still be acknowledged, that cases of narrowness from distortion sometimes, though seldom, do occur, in which a dead child cannot be extracted by the scissars and crotchet, even in the hands of the most skilful and dexterous practitioner.—Shall we, *then*, be unconcerned spectators of the fatal event that must ensue? Or, shall we dare to interfere; and, by an operation apparently cruel, and from its consequences desperate, make a last effort of that assistance which our limited art affords in behalf of our patient\*?

\* I have been just informed, on authority which I trust, of a work lately published on the Continent, which contains many cases of utility of the *division of the pubes*, where “a considerable space was gained by the operation.”—The account of this publication hath not yet appeared in any of the foreign Journals.

F I N I S.



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