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THE GIFT OF
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THE

PROCESS OF PARTURITION.

ILLUSTRATED BY

ONE HUNDRED AND FORTY-TWO FIGURES.

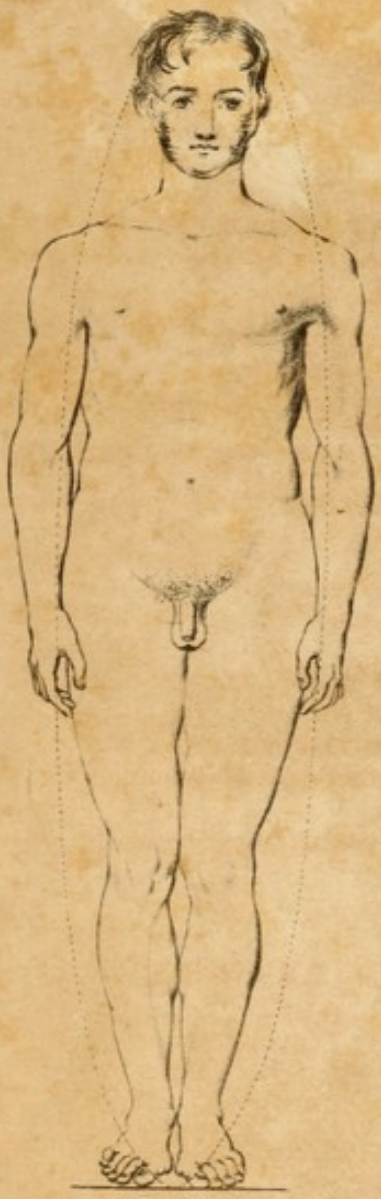


Fig. 1.

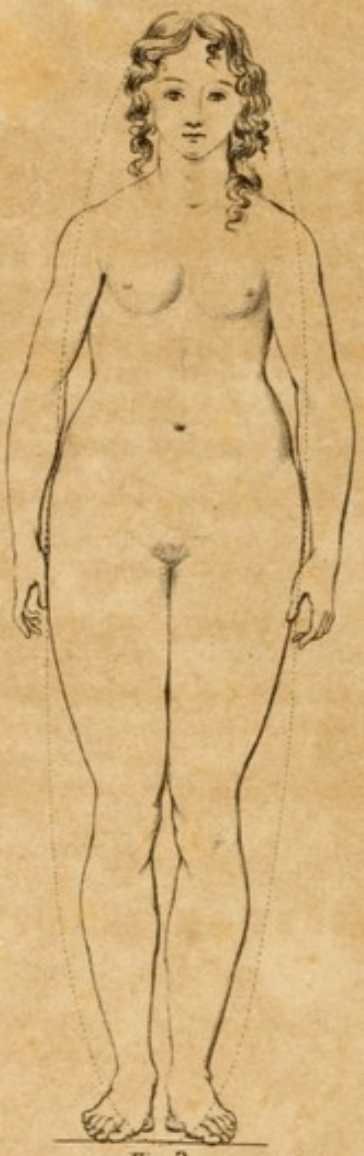


Fig. 2.

Sinclair's Lith.

THE

PRINCIPLES AND PRACTICE

OF

OBSTETRIC MEDICINE AND SURGERY,

IN REFERENCE TO THE

PROCESS OF PARTURITION.

Illustrated by One Hundred and forty-two figures.

BY

FRANCIS H. RAMSBOTHAM, M. D.

CONSULTING PHYSICIAN IN OBSTETRIC CASES TO, AND LECTURER ON OBSTETRIC AND FORENSIC MEDICINE AT, THE LONDON HOSPITAL, PHYSICIAN TO THE ROYAL MATERNITY CHARITY, OBSTETRIC PHYSICIAN TO THE EASTERN AND TOWER HAMLETS' DISPENSARIES.

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TO

JOHN RAMSBOTHAM, M. D.,

CONSULTING PHYSICIAN TO THE ROYAL MATERNITY CHARITY;

LATE LECTURER ON OBSTETRIC MEDICINE AT THE LONDON HOSPITAL, &C. &C.

SIR,

Permit me to inscribe to you the following pages, the fruits principally of your instructions, as a tribute justly due to your station in the medical profession, and an earnest of the reverential feelings with which you are regarded by

A MOST GRATEFUL SON.

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PREFACE.

Should any apology be deemed necessary for obtruding on the medical public a new work on obstetric science, it may, perhaps, be furnished by the interest which that department of medicine has acquired of late years, and the attention it now commands from the profession. The numerous valuable publications on the subject that have recently issued from the press, forcibly demonstrate the high position it has attained as a part of medical studies; and it is confidently hoped that the present addition to the stock of obstetric literature, drawn up on a somewhat novel plan, will not be considered altogether superfluous.

This branch of physic, indeed, has struggled against far greater difficulties than have beset the general practice of medicine and surgery; for both ignorance and prejudice have lent their aid towards retarding its advancement. On the one hand, it has had to contend with the natural prejudices that females themselves must entertain against admitting a person of the opposite sex to undertake the duties required under the trying time of labour; and on the other, with the erroneous belief that parturition, being a natural action, would be accomplished in woman with equal facility and safety as in the brute creation. Arguments, sufficiently strong and numerous, could be adduced to prove the fallacy of the latter assumption, but they are foreign to our immediate purpose. And although the change has been effected but slowly, the prejudice existing in the female breast has now, happily for them, given way to a sense of the security they enjoy in placing themselves under the superintendence of well-educated surgeons.

The continental universities took the lead in enrolling *midwifery*, as it is called, among their obligatory studies; and most of the British institutions of a like nature have tardily followed in their steps. It cannot be necessary to enforce by reasoning the propriety of the regulations they have

adopted; but whatever circumstances may have impelled them to such decisions, cannot be devoid of interest, and are therefore worthy of being recorded.

As far as the London corporations are concerned, much may be attributed to the exertions of a society established in 1826, under the title of the Obstetric Society of London. This body consisted of about thirty members, embracing, with the exception of two or three, all the then present and late lecturers on obstetric medicine in London, besides a few other practitioners; and the editor of this work acted as honorary secretary. The object of the society was to place the practice of obstetric medicine on a more respectable footing than it had hitherto enjoyed. It was proposed to accomplish this by inducing the Colleges of Physicians and Surgeons of this city to abrogate their by-laws, which precluded practitioners in "midwifery" from the fellowship of the one, and a seat at the council-board of the other; and by requiring the College of Surgeons, and Society of Apothecaries, not only to make obstetric science the subject of examination, but to oblige all candidates who offered themselves for their diploma to adduce testimonials of having diligently applied themselves to its study.

A lengthened correspondence passed between the committee and the secretary of state for the home department, as also with the London medical corporations. Sir Robert Peel, at that time at the head of the Home Office entered warmly into the question, honoured a deputation of the society with an interview, put himself in communication with the medical corporations on the subject of the memorials addressed to him, and allowed a great part of the correspondence which passed between them and the society to be transmitted through his office.

All the objects which the society proposed have since been carried into effect, except the change in the constitution of the council of the College of Surgeons; and thus, to the perseverance of a very few members of the profession may justly be attributed the adoption of measures fraught with the highest possible advantage to the community, inasmuch as they tend to enhance the acquirements of the great mass of English practitioners.

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OBSTETRIC MEDICINE

AND

SURGERY.

OF THE PELVIS.

Plates.—II., III., IV.

Before the mechanism of parturition can be understood, it is necessary to describe the organs subservient to the process, and with this view the bony pelvis first offers itself to the attention.

The term *pelvis* is applied to that mass of bones which, placed at the bottom of the spinal column, and resting on the inferior extremities, connects the thighs with the upper part of the trunk. When divested of its soft structures, this organ somewhat resembles a basin, and hence its name; for the Greeks called it πιλυξ, a wooden utensil of bowl-form, used for domestic purposes; the Latins from them derived the word pelvis, which we have adopted. In many of the older anatomical works it is described as "the basin," but all the recent authors have preferred the more classical appellation of pelvis.

Division of the bones of the pelvis.—In the adult state it is composed of four bones, two *ossa innominata,* which form the parietes at the side and in the front; the *os sacrum* and the *os coxygis,* which bound the cavity behind. But until the age of childhood is considerably advanced, many points of ossification are observed in each of these bones, separated by intervening portions of cartilage; these cartilaginous septa are gradually absorbed as growth advances, and ossific matter is deposited in their stead; so that one solid bone is formed of what originally consisted of many pieces.

This arrangement is particularly remarkable in the os innominatum, which during the period of infancy is divided into three distinct parts.

In describing the os innominatum, therefore, anatomists have preserved the distinction of these separate bones, marked out in early life; and demonstrate it as though it still consisted of the three original portions. To the superior division they give the name of *os ilium;* Plate II., fig. 3,(1) to the inferior that of *os ischium;*(2) and to the anterior that of *os pubis.*(3)

The white lines in the figure, drawn from the os innominatum of the left side, distinguish with sufficient clearness the natural division of the bone in the young subject.

Figs. 4 & 5, Plate II. represent the left os innominatum of the adult. The first gives a view of the outer, the second of the inner surface.

The Os Ilium, Hip or Haunch Bone, is the largest of the three divisions of the os innominatum; and it is uppermost in position. It is remarkable for some peculiarities, which, in an obstetrical point of view, as well as anatomically, are worthy of consideration. It has an outer and an inner surface; the outer is called dorsum, Plate II. fig. 4.(*a*) and may be said to be irregularly convex; it is marked by eminences and depressions indicative of the attachment of the three powerful glutæi muscles. The chief extent of the inner surface is concave and smooth, and is called the venter. The lower portion, the base or body, is the thickest part of the bone, and enters largely into the composition of the acetabulum,(*b*) a cavity for the reception of the head of the femur,—in conjunction with which it forms the hip-joint. Just above the base the bone narrows into a kind of neck, from which springs the *ala* or *wing*,(*a*) rising obliquely upwards, outwards, backwards, and forwards, to protect and support the lower abdominal viscera. The ala terminates superiorly in a ridge, running along its whole extent, called the *crista ilii, crest* or *spine* of the *ilium.*(*c*) This ridge is tipped with a deep layer of cartilage in the child, as is shown in Fig. 1. Pl. II. To different parts of the crest are attached the oblique and transverse abdominal muscles, the latissimus dorsi, the erector spinæ, and the quadratus lumborum. The crista ilii ends both anteriorly and posteriorly in a jutting prominence, to which the term spinous process is applied; beneath each of these prominences there is a slight sinuosity; and below them, again, another jutting point of bone, also called spinous process: so that there are four spinous processes belonging to the ilium; an anterior superior,(*d*) an anterior inferior,(*e*) a posterior superior,(*f*) and a posterior inferior.(*g*) From the anterior, powerful muscles take their origin. The anterior superior spinous process gives attachment to one end of Poupart's or Gimbernat's ligament; to the tensor vaginæ femoris, and the sartorius muscles. From the anterior inferior arises the longer portion of the rectus femoris. Into the posterior are inserted strong ligaments, which bind this bone most firmly to the sacrum. Below the posterior inferior spinous process there is a considerable sinuosity or arch,(*h*) forming, when the bone is joined to



Fig. 3.

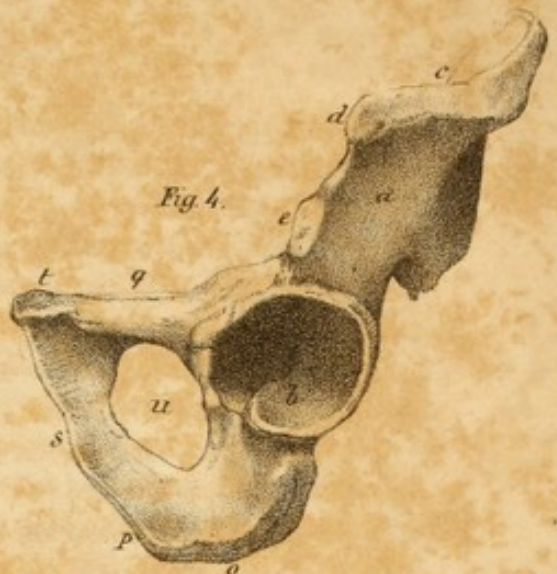


Fig. 4.



Fig. 5.



Fig. 7.



Fig. 6.



Fig. 8.

Sinclair's Lith.

the sacrum, a very large notch: this is called the sciatic notch. But in the recent pelvis this notch is perfected into two foramina—an upper one, the larger, and a lower one, the smaller—by ligaments, hereafter to be described, which run from the side to the back part of the pelvis; and therefore, when the ligaments are preserved, their apertures are called the sciatic foramina. Plates III., and IV., fig. 14. Through the larger of these pass the gluteal, sciatic, and pudic arteries; the sciatic and pudic nerves, and the pyriform muscle. Through the smaller the pudic arteries and nerve re-enter the pelvis, and the obturator internus muscle passes out.

That portion of the internal face of the ilium, which is smooth and concave, Plate II., fig. 5,(*k*) supplies a bed for the reception of the iliacus internus muscle; but the posterior part(*l*) is very rough, and marks the connexion between the ilium and the sacrum. This union forms one of the two *sacro-iliac symphyses,* or posterior joints of the pelvis, there being one on each side of the sacrum. Between the ilium and sacrum, at this junction, is interposed a piece of fibro-cartilage, about a sixth or eighth of an inch in thickness, so that the bones are separated to that extent; and it is invariably remarked, provided the joint is healthy, that, when the ligaments are cut, and the two bones forcibly wrenched asunder after death, the cartilage adheres to the sacrum, leaving the ilium denuded. In structure it is more like the intervertebral substance than any other tissue of the body: it is arranged in concentric layers, and is softer towards its posterior edge than in the front. The object of this soft elastic pad being situated in this place is evidently to break the shock, and prevent the jarring sensation which must otherwise have been experienced, in the violent actions of the body, such as running and leaping; and it may also act as a cement in glueing the bones together. Traversing the inner surface horizontally, there is a ridge, which divides the ala from the lower part,(*m*) and which is more evident in the entire pelvis, forming a portion of the *pelvic brim, linea innominata,* or *linea ilio-pectinea.* Plate III., fig. 11.

The ilium is connected to the ischium and pubes in the acetabulum, and to the sacrum by means of the sacro-iliac symphysis.

Second in size and lowest in position of the three divisions of the os innominatum, is the Os Ischium, Os Sedentarium, or seat bone, so called from being that portion of the bone on which we rest when sitting. It is remarkable for a *base* or *body, a spinous process, its tuberosity,* and *ascending ramus.* The base is the thickest part, and assists even more largely than the base of the ilium in the formation of the acetabulum. Immediately below the base there is a narrowed portion that may be called the *neck,* and arising from the posterior part of the neck, jutting backwards and inwards, there is a thin pyramidal process, somewhat like the point of a lancet, to which the appellation of *spinous process*(*n*) is given.

This affords attachment to one fasciculus of the sacro-sciatic or sacro-ischiatic ligaments, and gives origin to the coxygeus muscle, which is inserted into the coxyx, to raise that bone. This spinous process is an object of more intense interest to the obstetrician than its small size would lead us to suppose; because it is sometimes of undue length, or is bent too much inwardly. By such a construction, the capacity of the outlet is materially encroached upon and diminished, and, in a proportionate degree, the passage of the child's head in labour is retarded. In its descent downwards from the neck, the bone bulges out into a considerable protuberance, the *tuber ischii*, or *tuberosity of the ischium;* and, rising obliquely upwards, forwards, and inwards, a flat, narrow sheet of bone extends, to meet a similar piece of bone sent down from the pubes,—the *ramus of the ischium.*(*p*) This bone is also rough externally and smooth within: to the lowest part of the tuber is attached one end of the other fasciculus of the sacro-sciatic ligament; whilst the outer portion gives origin to the semi-membranosus, semi-tendinosus, the long head of the biceps flexor cruris, and quadratus femoris muscles. The ischium is connected to the ilium and pubes in the acetabulum: it is firmly connected also to the sacrum; not by direct junction or bony union, but by means of the ligaments just mentioned.

The smallest of the three divisions of the os innominatum is the os PUBIS, PECTEN, OR SHARE BONE, situated anteriorly. It, like the ilium and ischium, possesses a *base* or *body;* it has two rami, a *horizontal* and a *descending ramus*, a *spinous process*, and a *symphysis.* The base is its thickest part, and contributes but in a small proportion to form the acetabulum. Just anterior to the base there is a contracted part, the neck, and running horizontally forwards and inwards, so as to meet its fellow of the opposite side, a thin, narrowed piece of bone is thrown out—the *horizontal ramus* of the pubes.(*q*) This terminates in a wider sheet, and its edge, the point of junction with its fellow bone, is called the symphysis pubis:(*r*) it is the anterior joint of the pelvis. The pubic bones are not, however, in contact here; for there is a considerable thickness of the same kind of cartilaginous matter placed between them as is found at the sacro-iliac symphyses. Some anatomists have affirmed that there is a double joint, one on each side of the central cartilage; others, that there is only one; and others, again, that although occasionally an imperfect synovial membrane may be seen, by far most frequently neither can a cavity be detected, nor any apparatus indicative of the presence of a joint: and this latter seems to be the idea of the best anatomists of the present day. From the thickness of the interposed substance, a slight lateral motion may possibly be allowed to the bones, even in the healthy state of the parts; but the strength of the ligaments, both within and without, would prevent any

Fig. 9

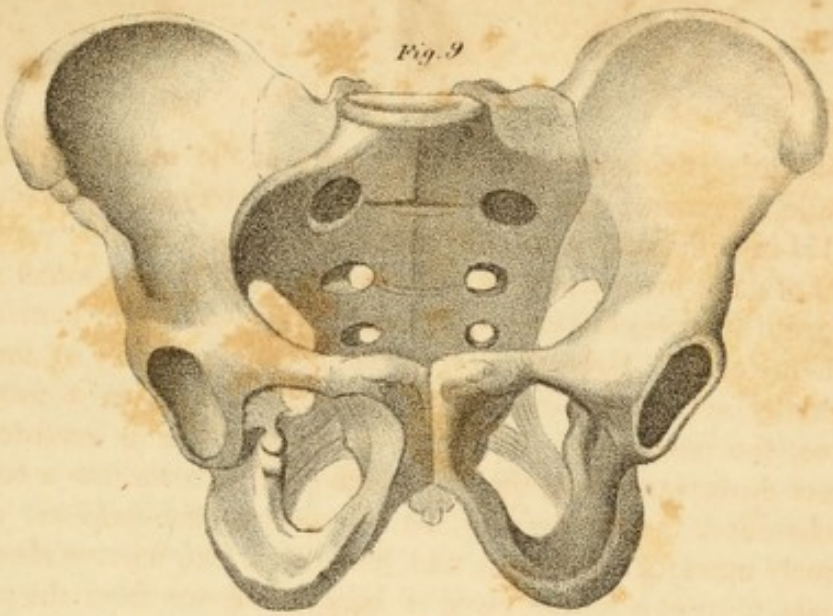


Fig. 10.

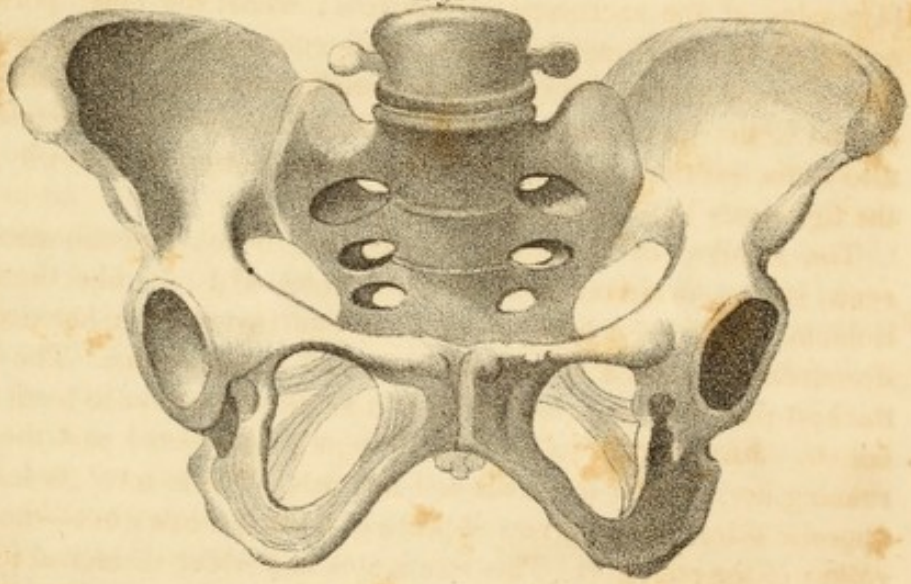


Fig. 11.



Sinclairs' Lith. Phil.ª

considerable movement. Proceeding from the symphysis, in a direction downwards, outwards, and rather backwards, to be joined by ossific union with the ramus ischii, there is another flat, thin, and narrow sheet of bone —*the descending ramus of the pubes.*(*s*) This bone is, like the other two, rough externally, and smooth within: from the outer surface some of the adductor muscles of the thigh take their rise. On the interior, running along the upper margin of the horizontal ramus, there is a ridge, sometimes rather sharp, which is a part of the brim of the pelvis, and at its inner extremity it terminates in a little eminence—the *spinous process.*(*t*) To this is attached the pubic end of Poupart's ligament, near it the pectineus; the oblique and transverse muscles, the pyramidalis, and rectus abdominis, are also inserted into different portions of the upper edge of the pubes. The pubes is connected with the ilium and ischium in the acetabulum, with the ischium at the junction of their rami, and with its fellow bone of the opposite side by the symphysis.*

When the os innominatum is again regarded as a whole, the attention cannot fail to be arrested by a large oval aperture in the fore part, formed by the ischium and pubes—the *thyroid* or *obturator foramen.*(*u*) In the recent pelvis it is almost entirely filled up by the obturator ligament, which consists merely of two layers of periosteum, one externally, the other within, continued from the bone across it. The space is entirely covered by this extension of the periosteum, except at the uppermost part, where a hole is left, not larger than would permit the passage of a small bougie: through it the obturator vessels and nerve escape from the pelvis. This ligament supplies the place of bone; for the obturator externus, one of the rotators of the thigh, arises from its outer surface. It appears to be placed here for the purpose of rendering this part of the body lighter than it would be, were a thick piece of bone present instead.

There is another point, in regard to these three divisions of the os innominatum, worthy the consideration of the obstetrician; namely, the relation which each bears to those parts of the pelvis, hereafter to be more particularly described,—the brim and outlet. The ilium forms a considerable share of the brim, but none of the outlet; the ischium forms a part of the outlet, but none of the brim; while the pubes enters very largely into the composition of both the brim and outlet: so that the ilium might be greatly deformed, and yet the brim alone suffer; a distorted ischium would only involve the outlet; but if the pubes were of vicious formation, both brim and outlet must necessarily be implicated.

* The term *pubes* was applied to this bone in consequence of its intimate connexion with the external organs of generation; and that of *pecten* from its fancied resemblance to a comb, when the two are united.

The pelvic cavity is bounded posteriorly by the *os sacrum, os basilare,* or *rump bone,* and the *os coxygis,* which are also called the *false vertebræ.*

The os Sacrum, os Basilare, is the largest bone in the vertebral column: in form it is triangular, the apex of the pyramid being placed downwards, and rather backwards, the base upwards, and inclined a little forwards. Its specific gravity is small; indeed, it is the lightest bone in the body for its size, and, consequently, rather spongy in structure. It possesses four surfaces—an external, an internal, and two lateral. The inner face of the sacrum and coxyx is represented in Plate II. fig. 6. The external surface is convex and rough; and there are four or five processes placed below each other in a perpendicular line, more strongly marked at the upper part of the bone, assimilated to the spinous processes of the vertebræ; they may therefore be called the *spinous processes of the sacrum.* The bone indeed appears, as it were, an imperfect continuation of the vertebral column; the peculiarities of the vertebræ becoming less evident, and dwindling away by degrees in the sacrum as they descend. Anterior to this series of processes, there is a hollow cavity extending the whole length of the bone—a continuation of the spinal canal—for the reception of the *Cauda equina,* which is the inferior portion of the spinal marrow. Four pairs of holes are seen, one on the side of each spinous process, communicating with this canal: these are for the transmission of small nerves from the cauda equina to the soft parts covering the sacrum and structures adjacent. Internally the sacrum is smooth, resembling in this respect the other bones of the pelvis, and concave. Four white lines, generally rather eminent, run horizontally across it, indicating the situation of cartilage in early life, by which the bone was divided into five distinct pieces. There are also four pairs of holes within; one at the extremity of each of these white lines, for the transmission of nervous filaments, to form a portion of the great sciatic nerve, as well as to supply the organs contained within the pelvis. The concave plane—the *cavity* or *hollow* of the sacrum(*a*)—varies in regard to the segment of the circle which it forms in different individuals; and if it be too straight, or too much curved, it will equally impede the ready passage of the child's head in labour. The centre of the upper edge of the bone projects forward; so that in its natural position this part looks somewhat over the cavity, and diminishes the space at the brim. This is called the *prominence* or *promontory* of the sacrum.(*b*) On it the last lumbar vertebra rests, a portion of intervertebral substance being placed between them; and it supports the whole weight of the trunk, head, and superior extremities. When the brim of the pelvis is distorted, the irregularity of shape is almost always attributable to the prominence of the sacrum, together,

perhaps, with the last lumbar vertebra being thrown too far forwards, and too closely approaching the pubes. The entrance to the cavity is thus preternaturally constricted; and the diminution of space in this way produced is one of the most common causes of lingering labour met with in this city.

The lateral surfaces(*c*) are very rough, and correspond in extent and irregularity with that part of the inner face of the ilium which forms the sacro-iliac symphysis.

This bone is connected at its upper part to the last lumbar vertebra, through the intervention of a layer of intervertebral substance, to the coxyx below, by a moveable, ginglimoid joint, and to the ilium on each side by the sacro-iliac symphyses. It is also connected to the ischium by the sacro-sciatic ligaments.

The os Coxygis* (*d*) appears like a continuation of, or an appurtenance to, the sacrum; but it is of much importance in obstetrical study. It was denominated coxyx from its resemblance to the beak of the cuckoo, one of the hawk tribe. It is therefore, as the name would imply, in shape hooked and pyramidal: the base is placed upwards, the apex below. The bone is divided into three, and sometimes four, distinct portions, which play upon each other by separate joints. Externally it is convex and irregular, concave and smooth within, and terminates in a tapering point, which is bent forwards in the ordinary state of the parts to support the lower end of the rectum.

The coxygeal joints are of great value in the process of labour. Their mobility much facilitates the exit of the head, by enlarging the outlet of the pelvis in the antero-posterior direction. The increase of space thus gained amounts to an inch or more; for the point of the bone may be bent backwards to a line continuous with the sacrum, or even beyond, so as to form an angle outwards, Plate IV, fig. 14, *a. b.*

Occasionally, indeed, the coxyx becomes anchelosed to the sacrum, and its own joints also are destroyed by a deposition of osseous matter between the separate pieces, so that their mobility is lost, and the bone becomes, as it were, a portion of the sacrum itself. Such a consolidation must offer a considerable impediment to the expulsion of the head, by contracting the pelvic outlet: and this, though a rare, is therefore another cause of lingering labour. It is most usually met with in women bearing a first child late in life, and those who have been accustomed to sit through the principal part of the day, as is the case with milliners.

When the coxyx is in this state, it will sometimes break: this may happen as well during a strong, unaided uterine contraction, as under the

* Κοκκυξ, a cuckoo.

employment of instruments. The occurrence of such an accident may be known,—perhaps, by the attendant being sensible of the part having given way, while his hand was employed protecting the perineum;—and perhaps by his hearing the noise peculiar to bones when fractured. I have seen three cases in which the bone broke, or the anchelosed joint gave way; in none of these did any permanent injury ensue. There was some pain and inconvenience for a time, but eventually re-union was effected, and the distress occasioned was inconsiderable. The best mode of treating such a mischance would be to keep the patient in a state of perfect rest, to interdict her lying on her back, to prevent, if possible, any external pressure on the part, and to keep the bowels moderately open. On the one hand, the frequent evacuation of the rectum, by causing almost constant movement of the fractured portions one upon the other, would interfere with ossific union: and, again, if the lower bowels became filled with hardened fæces, their expulsion would probably disturb whatever degree of reparation might have been procured. Thus, both extremes of immoderate action and excessive constipation must be avoided. In the management of the patient, not only should our object be directed towards obtaining a consolidation of the separated ends, but we should also endeavour to preserve the coxyx, as nearly as we can, in a continuous line with the sacrum; for it is evident, that if the junction take place while the point of that bone is directed grealy forwards, the size of the pelvic outlet will be lessened in the same degree; and in any subsequent labour a proportionate difficulty will necessarily exist. The coxyx is called venacularly the *huckle* or *knuckle*, and sometimes the *whistle-bone*.

Form and Dimensions of the Pelvis.—When we examine the pelvis with reference to labour, we must attend not only to its figure, but also to its dimensions, and the bearings which its axes hold in regard to each other, and to the trunk of the body. We observe that it is formed on the principle of the double arch, which structure in architecture possesses the greatest possible degree of firmness that can be devised for the quantity of material employed. So that the pelvis combines, to an eminent extent, the qualities of strength and lightness.

Anatomists distinguish the pelvis into two grand divisions, the *true* and the *false pelvis*, considering the *alæ ilii* to constitute the false portion. The alæ ilii, however, are of trifling interest to us as obstetricians; for, unless the organ be inordinately distorted, they have little or no influence over the process of parturition, being quite out of the way of the head's descent. Obstetrically it is divided into the *brim*, or superior aperture, Plate III. fig. 11; the *outlet*, or inferior aperture, Plate IV. fig. 12; and the *cavity* all that is embraced between these two; and the peculiarities belonging to each of these parts offer themselves next for observation.

In demonstrating the shape and size of the female pelvis, it is the custom not to describe any particular specimen which we may happen to possess, but to assume a model of perfection, which we consider *the standard;* so symmetrically formed, as would most completely answer all the intentions that nature has assigned to it.

The Brim, somewhat oval in shape, has necessarily two diameters,—the longest from side to side—the shortest in the centre from before backwards. The regularity of the oval is broken, principally by the jutting forwards of the sacral promontory Plate III. fig. 11, (*a*,) so that the outline represents, in some measure, the heart, as painted upon playing cards. But this resemblance is stronger in the male than in the pelvis of the opposite sex, because the longest diameter in the male pelvis is antero-posteriorly, Plate III. fig. 9, while in the female, as just shown, it is laterally, fig. 10.

The *lateral, transverse,* or *iliac* diameter, measures five inches and a quarter, Plate III. fig. 11, (*c. d.;*) the *antero-posterior, sacro-pubic,* or *conjugate,* measures four (*a. b.;*) the two *oblique,* or *diagonal,* extending from the sacro-iliac symphysis to the ramus of the pubes, on the opposite side of the body (*e. f.,*) are nearly the same as the direct lateral, probably not so great by about a quarter of an inch. These admeasurements are, of course, considerably less in the recent pelvis and the living body, in consequence of the room occupied by the soft structures; we must allow for their lodgment at least a quarter of an inch in the conjugate diameter, and half an inch in the lateral, to which extent the available space in labour will probably be diminished.

It has been much disputed whether the iliac or the oblique diameter should be considered the longest; we shall find, I think, that in by far the greatest proportion of well-formed pelves, divested of the softer parts, the iliac measures most; but when the contents, linings, and muscles are preserved, the greatest space is along the oblique line.

The Cavity is observed to be deep behind, shallow in front; and it becomes gradually shallower as we traverse from the back to the fore part. The greatest depth is from the sacral promontory to the tip of the coxyx, and should be from five inches and a half to six inches; at the side, from the lowest point of the tuber ischii to the brim, three inches and a half; and behind the symphysis pubis, one and a half, Plate IV. fig. 14.

The Outlet is also inclining to an oval shape, but is even of greater irregularity than the brim, owing principally to the projection of the tip of the coxyx behind, and to the large sinuosity in front, the arch of the pubes, Plate III. fig. 10, and IV. fig. 12, (*a. b.*) In extent the diameters of the outlet are nearly the same as at the brim; in situation they are reversed. Thus the long diameter is from before backwards, in a line ex-

tending from the point of the coxyx to the under edge of the symphysis pubis, Plate IV. fig. 12, (*a.*;) and when the bone is pressed back in labour, this measures five inches or more; although, in the ordinary state of the parts, the extremity being directed forwards, its utmost extent is only four. The short diameter extends laterally, from the tuberosity of one ischium to that of the other, is incapable of being increased, and measures four. (*b.*)

The outlet is bounded by the tip of the coxyx at the back, by the lower edge of the under fasciculus of the sacro-sciatic ligament posteriorly and laterally, by the tuberosities of the ischia at the side, by the ramus of the ischia and pubes anteriorly and laterally, and by the symphysis pubis in front.

The position of the pelvis, in regard to the trunk of the body, is neither perpendicular to the horizon, nor horizontal, but oblique, the sacral promontory being raised considerably below the level of the pubes; so that a line drawn through the trunk, in a direction of its axis, would, in falling downwards, strike on the centre of the symphysis pubis. It is by resting on this bone that the uterus is supported during the latter months of pregnancy. Were the axes of the trunk and pelvic entrance in the same line, owing to the upright position of the human female, the womb, towards the close of gestation, would gravitate low into the pelvis, and produce most injurious pressure on the contained viscera; while, in the early months, not only would the same distressful inconvenience be occasioned, but there would be great danger of its protruding externally, and appearing as a tumour between the thighs, covered by the inverted vagina. In the quadruped, since the uterus is entirely supported by the abdominal parietes, the effects of gravity on the pelvis need not be counteracted; and we therefore find, that in consequence of the lumbar vertebræ being slightly arched upwards, the axes of the trunk, brim, and outlet are placed nearly in a continuous line.

In Plate II. fig. 7, the two dotted lines mark the axes of the trunk and pelvic entrance in the human subject. In fig. 8, representing the skeleton of a cat, a single line runs entirely through the trunk and pelvis.

The pelvis itself has also two *axes*, one of the brim, which is downwards and backwards, following a direction from the umbilicus to the coxygeal extremity of the spinal column; and the other of the outlet, which is downwards and forwards, from the promontory of the sacrum to the central space between the tuberosities of the ischia; so that a line drawn through the brim, in the direction of the axis of the brim, would cross, at a considerable angle, another line drawn in the direction of the axis of the outlet, Plate IV. fig. 14. By a knowledge of the axes of the trunk and pelvic entrance, we can place our patient under labour in the posture most favourable to the easy descent of the fœtal head

through the brim into the cavity; this is on the side, (the left is usually chosen in this country,) with the shoulders thrown forwards, the back bent into a curve, the thighs drawn up towards the abdomen, and the legs flexed towards the thighs. In this position the two axes are brought more nearly into one line than in any other, and the head is directed more completely over the centre of the brim. It is equally necessary, or even more so, to keep strictly in mind the relation that the two axes of the brim and outlet bear to each other; and this especially while performing any obstetrical operation. When using the forceps, for example, should we neglect this most essential precaution, we shall not only, in all probability, be foiled in accomplishing delivery, but we shall run the almost certain risk of inflicting irreparable injury on the woman.

Joints and Ligaments of the Pelvis.—Besides the joints proper to the coxyx, the pelvis possesses three others already mentioned;—one uniting the pubic bones in front, the symphysis pubis—and one on each side of the sacrum, connecting that bone with the ilia, the sacro-iliac symphyses. These articulations are bound together by exceedingly strong unyielding ligaments, as well within as externally. The ligamentous expansions on the interior of the pelvis are much thinner than those on the outside; and although they assist greatly in strengthening the connexions of the bones, they occupy but little space, and consequently do not encroach, in any considerable degree, upon the room required by the head in labour.

In addition to the ligaments belonging to the joints, there are the *obturator* ligaments, filling up almost the whole of the obturator foramina; and the *sacro-sciatic*, or *sacro-ischiatic* ligaments, of much interest to the obstetrical student. These run in two fasciculi on each side, the lower obliquely upwards, and backwards from the base of the tuber ischii to the side of the sacrum, and the other horizontally backwards from the spinous process of the ischium to the lower part of the sacrum and the coxyx; and both are widely spread on the outside of the last-named bones like a fan, Plate IV. figs. 13 and 14. They tend, in a great degree, to render the outlet of the pelvis firm, by connecting together the sacrum and the ischia. They partake of the relaxation which the soft structures undergo in labour, and a preternatural rigidity existing in their fibres is occasionally a cause of retardation in the process.

Separation of the Joints of the Pelvis during Labour.—It was for many centuries the prevalent opinion that the bones of the pelvis always separated, or were disposed to separate, if occasion required it, during parturition, especially at the symphysis pubis, and thus allowed the pelvic dimensions to be increased in every direction. This idea was rendered more probable by analogy; for it is said that in some animals, as the cow,

the bones are absolutely disunited to some extent; and that the sinking of the sacrum, occasioned by its own weight and by the softened condition of the ligaments, together with a difficulty in progressive motion, is an indication of the near approach of parturition. Such a separation may possibly take place in the lower animals, but it is certainly not usually the case in the human subject. The joints are liable, indeed, to inflammation; and pus being secreted between the bones may occasion disunion—a disease attended with high constitutional excitement, and no small danger. Sometimes, also, an actual separation of the bones takes place, both during pregnancy and after labour, from simple relaxation of the ligaments, which state gives rise to pain in the part deranged, and an inability to walk or stand without artificial support. This affection, though not attended with so much suffering or hazard as acute inflammation, is nevertheless of a very distressing character, and very difficult of cure; commonly confining the patient to bed or the sofa for many months. But it would be travelling too far out of the limits of this publication to enter minutely into the history of these diseases; and it is sufficient for our present purpose to know that in the great majority of cases, there is no sensible relaxation of the pubic or sacro-iliac ligaments; that in others a softening does occur in various degrees, and that when that change reaches such a point as to be attended with pain or inconvenience, it must be considered as morbid.

Difference in Form between the Male and Female Pelvis and Skeleton.—On comparing the male, Plate III. fig. 9, and female pelvis, fig. 10, together, we cannot but remark a striking difference in the general appearance and particular proportions of this organ in the two sexes. We observe that the pelvis of the female is altogether larger and more delicately shaped than that of the male; that the alæ of the ilia spread themselves widely in the lateral direction; while the same parts in the male rise more perpendicularly upwards. The brim is differently shaped; the long diameter in the female being from side to side; in the male from before backwards. The cavity is considerably smaller in the male, deeper, and more of a funnel shape, the sacrum being much straighter, Plate IV. fig. 13, and the tuberosities of the ischia inclining closer together. The outlet is also far less capacious; and this arises principally from the approximation of the ischia, which seldom are more than three inches distant at the widest diameter. The arch of the pubes is formed more angularly than in the female, in whom this part approaches nearer to the perfection of an arch, Plate III. figs. 9 and 10. In the female, too, the rami of the ischia and pubes are smoother on their inner surface, and their anterior edge is turned more outwards. This disposition of the rami

helps to enlarge the outlet, and gives an elegance to the whole organ that is wanting in the pelvis of the stronger sex.

All the bones of the male skeleton are firmer and heavier than they are in the female, and more powerfully marked by those irregularities which indicate muscular attachments. The thoracic cavity is comparatively larger, and the acromia are at a greater distance from each other. A line drawn from the head of the humerus, perpendicularly downwards, would fall to the ground altogether clear of the pelvis; but in a well-articulated female skeleton, the same line would rest within the ala of the ilium. It is this difference that gives the broad shoulders to the male, and the swelling hips to the female, and occasions the principal distinction in the outline of the form between the sexes, Plate I. figs. 1 and 2.*

* These figures are sketched from Maygrier's work. It might perhaps be thought more desirable in some respects, if the characteristic difference between the male and female outline had been shown by drawings of the skeletons; but as the contrast by such a mode of illustration would not have been so strongly marked, I have preferred giving an etching of the full form. The elliptical lines will direct the eye to the principal points worthy of attention.

Fig. 12.

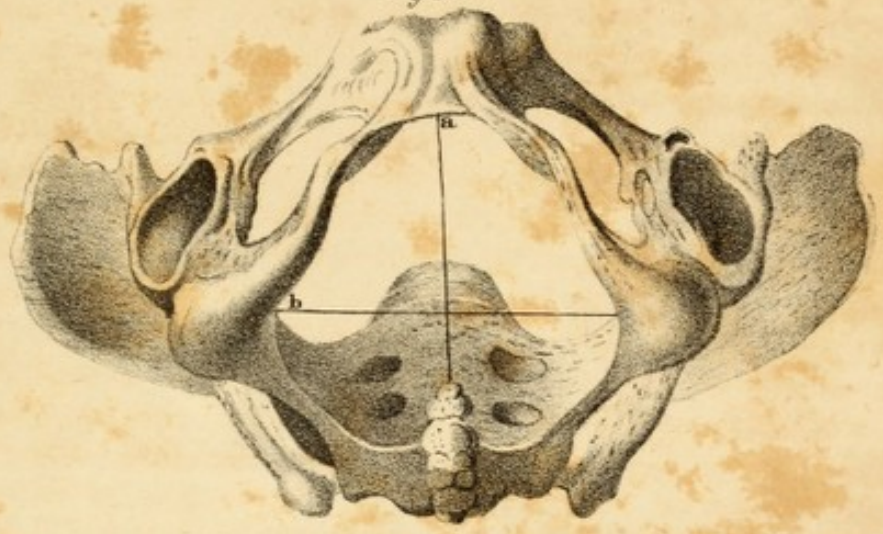


Fig. 13.

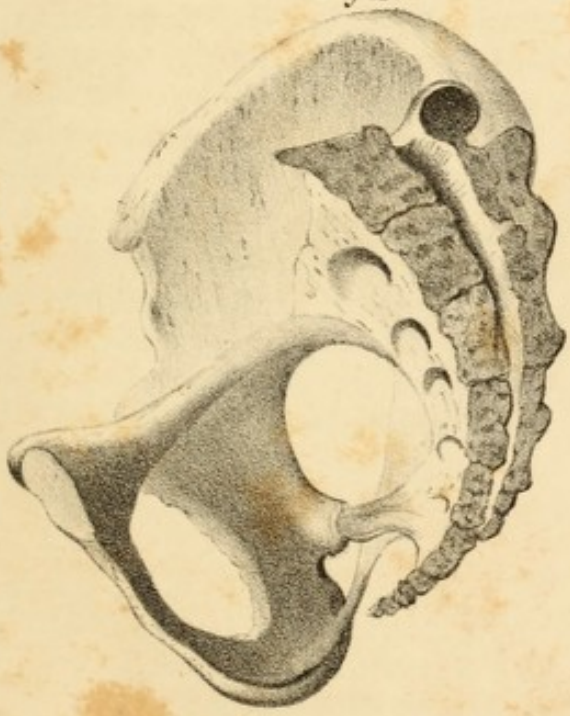
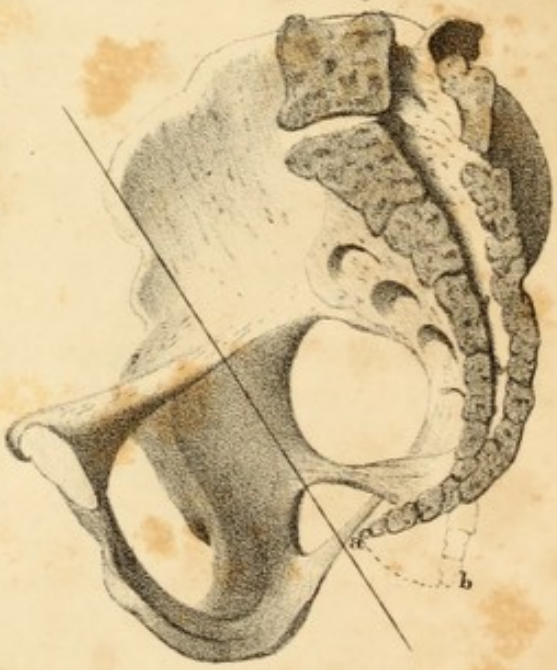


Fig. 14.



Sinclair Lith. Phil.ª

OF THE FŒTAL HEAD.

Plate V.

Shape and Dimensions of the Fœtal Head at Birth.—As both the brim and outlet of the pelvis present a form inclining to oval, so the fœtal skull is of a similar shape. It is, indeed, more perfectly oval; the long diameter, when the face is put out of calculation, being from the occiput to the forehead, Plate V. fig. 16, (*a. b.*;) the short from the tuberosity of one parietal bone, to that of the other, Plate V. fig. 18, (*a. b.*)

In extent, at birth, the long diameter measures four inches and a half, and the short three and a half; the circumference, drawn in a line over the ridge of the occipital bone, above the ears, and traversing the most prominent part of the frontal bones, is nearly fourteen inches. It must not be supposed that these measurements are exact or universal, any more than that the admeasurements given of the pelvis are always the same; but as we take a fancied standard pelvis as our guide, in the same manner we choose a standard head—such a one, perhaps, as is most commonly met with. I shall only mention one other diameter of the fœtal head, because, by multiplying such observations unnecessarily, the mind is distracted and the memory clogged, viz. that from the vertex to the chin, which is five inches and a half, capable, however, of elongation under labour, from the head being compressed laterally, to the extent of six and a half or seven inches.* The long diameter of the cranium, from

* It is generally remarked that the skull of the male child is a little larger in all its diameters than that of the female. Of sixty male, and sixty female children, born at full time, Dr. Jos. Clarke found the average circumference of the head to be 14 inches in the males; 13⅝ths in the females. The arch, from are to ear over the crown was 7¼th in the males, 7⅛th in the females. Of the 120 examined, only six exceeded 14½ inches round, and all these were males.—*Letter to Dr. Price.*

the forehead to the occiput, being four inches and a half, and the short diameter three and a half, it follows that when the head is properly adapted to the pelvis, a clear superabundant space of at least half an inch is left between the cranial and pelvic bones, both in the lateral and conjugate diameters, which is generally quite sufficient for the easy passage of the head.

Anatomical Peculiarities of the Fœtal Skull.—The general anatomical character, as well as the form and size of the skull, deserve our attention. It may be seen that the bones are not dove-tailed into each other as in the adult, but are separated to some extent by intervening lines and spaces of membranous formation. The lines are termed *sutures*, from the Latin word *suo*, to sew; the spaces, *fontanelles*, after the French; because it used to be supposed that a moisture distilled from the brain through these unossified apertures. The fontanelle has also been called bregma, from βρεχω, to moisten—the name having originated in the same idea.

The bones in the child's skull requiring our consideration obstetrically are but few, the two *parietal* bones of a square shape, which give the principal protection to the brain laterally, Plate V. fig. 18, (*a. b.*;) the *frontal* bone anteriorly, Plate V. fig. 15—or rather the frontal bones, because, in the fœtus there are two,—and the *occipital* posteriorly, Plate V. fig. 19. The *parietal* bones are separated from the frontal, or connected with them, by a suture called *caronal*, Plate V. fig. 17, and Plate V. figs. 15 and 16, which runs from near the external angle of one eye to the same point on the opposite side of the head, bounding the forehead superiorly. It is called *caronal*, because the ancients used to wear their *caronæ* or garlands on that part of the head upon festive occasions. The parietal bones are separated from the occipital by a suture, termed *lamdoidal*, from its resemblance to the Greek letter, Λ, Plate V. figs. 16 and 19. The two parietal bones are separated from each other by the *sagittal* suture, Plate V. fig. 18, which runs longitudinally along the centre of the upper part of the head, so called because it was fancifully supposed to be situated between the lamdoidal and coronal sutures, os an arrow is placed in a strung bow. The two frontal bones are separated by the frontal suture, Plate V. fig. 15, which runs directly upwards from the root of the nose. The remaining sutures of the head are out of the way of our obstetrical observation, and a description of them would therefore be useless.

The two fontanelles are placed, one at each extremity of the sagittal suture; and they are named, according to their situation, *anterior*, Plate V. figs. 15, 17 and 18, (*c*,) and *posterior*, Plate V. figs. 18 and 19 (*d.*) The anterior fontanelle is by far the larger, quadrangular or diamond-shaped: it is sufficiently extensive to take in the whole extremity of the finger, and

can scarcely be covered by it. The posterior is small and triangular. The peculiar form of the anterior fontanelle is caused by the junction of the corners of four bones rounded off, the two parietal and the two frontal; the posterior is formed as a triangle by the union of three bones, the superior posterior angles of the two parietal bones, and the upper angle of the occipital bone.

Necessity for Learning the Situation of the Fontanelles and Sutures.—An accurate knowledge of the form and situation of these fontanelles is of absolute necessity for the successful practice of the obstetric art; for by them we detect the position of the fœtal head in the the early stage of labour. The vertex is generally the presenting part, or that which offers itself most readily to the finger on examination.* This may be regarded, then, as the most natural presentation; the head, when placed with the vertex downwards, will pass through an aperture of much less dimensions than it would do, were any other part descending first. In Plate V. fig. 19, a view of the vertex is given, and two somewhat oval lines are traced surrounding it. One of these ovals is an inch, in its long diameter, greater than the other. The smaller shows the quantity of space requisite for the transit of the head, when the vertex offers itself, four inches and a quarter by three inches and a half in diameter; the larger indicates that necessary for the same head, when the brow or anterior fontanelle presents, being five inches and a quarter by three and a half; and by contrasting the two together, the student will be able to form a correct idea of the advantages appertaining to the presentation of the vertex.

If, then, in an obstetrical examination we distinguish the posterior fontanelle readily, we know that the vertex is presenting; we may presume that the fœtus is placed in the most favourable position, and we may augur, *cæteris paribus*, an easy termination of labour. If, on the contrary, we at once distinctly feel the large open, diamond-shaped space, we are satisfied that the brow or forehead is downward. We know that this is an unfortunate situation of the head, because so much more room will be occupied in its transit; and we are, therefore, prepared to expect that the case will be lingering; we may even feel justified in attempting to place the head in a better direction.

Nor is it of less moment that the sutures should be attended to. The cranium ordinarily enters the pelvis with the face looking to one sacro-iliac symphysis. Should we then detect the sagittal suture running diagonally across the pelvis, we infer that the long diameter of the head is in the direction of one of the long diameters of the pelvis, and so far all

* The term *vertex* is applied to that part of the head from whence the hair diverges as from a centre. It is generally described as being directly over, but in fact, it is placed rather before the posterior fontanelle.

is well; but if it crosses the brim in a direct line antero-posteriorly, the head is placed with its long diameter in the short diameter of the pelvic entrance; and we know that it cannot pass into the cavity while so situated, provided the skull and pelvis are both of normal form and size. Having obtained this information, we regulate by it both our prognosis and our practice.

Advantages of the peculiar structure of the Fœtal Head.—Many advantages attend on this peculiar conformation of the fœtal skull. On the one hand, the bones being separated by intervening lines and spaces, permit a more uniform growth and development to the tender brain than could take place had the cranium been originally composed of one solid bony case; and on the other hand, (which indeed most interests us as obstetricians,) a certain degree of compression is allowed under labour; the edge of each bone has an opportunity given to it to ride a little over its neighbour; the capacity of the child's head is thus diminished, and it is capable of being propelled through a smaller space than if it had been fashioned of one continuous piece. This power of diminution is greatest in the lateral diameter; and a full-grown fœtal head may be lessened from side to side, without endangering the child's life, one-seventh of its own extent, or from three inches and a half to three inches. This overlapping of the bones in labour is of common, nay, almost universal occurrence; and the compressibility of the head should teach us to hesitate, and consider well the bearings of the case, before we take in hand an obstetric instrument, especially such a one as cannot be used without the sacrifice of the child's life; for it is constantly observed in practice, that a fortunate and natural termination has occurred in cases where, a few hours before, it was believed impossible that the child could be born without instrumental interference.

Some practitioners suppose that another good effect is produced by the compressibility of the fœtal cranium. It is thought that, in the passage of the head through the pelvis, the child is thrown into a state of sleep or torpor, during which its limbs are for the time paralyzed, and it is consequently prevented injuring the maternal structures by any violent movement or struggle. I am inclined myself to subscribe to this opinion.

Expulsion of the Head vertically.—The student being now acquainted with the size and figure of the female pelvis, and the dimensions of the child's head, is prepared to understand the mechanism of its passage in cases of ordinary labour. It enters the brim with the vertex as the most dependent part, with the face to one ilium and the occiput to the other, or more commonly with the face looking towards one sacro-iliac symphysis, and the occiput behind the groin on the opposite side of the body. Descending in this direction, it takes full possession of the cavity, and the

forehead and occiput impinge respectively on the inner surfaces of the tuberosities of each ischium. Since, however, in this position, its long diameter is opposed to the short diameter of the outlet,—since the tuberosities of the ischia are unyielding,—and since the long diameter of the head exceeds the short diameter of the outlet by half an inch,—it is evident that a change in its relative situation must be made before it can be expelled. This alteration is effected by a slight rotation of the cranium; the face is thrown into the hollow of the sacrum, the occiput peeps up under the arch of the pubes, and the head eventually escapes with the face sweeping the sacrum, coxyx, and perineum. This turn is produced by mechanical causes, and depends on the resistance which the peculiar construction of the pelvic bones opposes to the propelling efforts exerted by the uterus:—the inner surfaces of the ischia, somewhat approaching each other as they descend, together with the spinous processes of the same bones, afford an inclined plane along which the head is directed; the hollow of the sacrum offers an unoccupied cavity, into which the face is received, and the arch of the pubes a wide-spreading sinuosity, through which the occiput insinuates itself. The fœtus, indeed, does not assist in the least degree, by any voluntary action of its own, to perfect this change; it is entirely to be explained on mechanical principles; and the opinion of the ancient physicians, that the child, by its innate powers, assists in liberating itself from its imprisonment, is perfectly fallacious.

Fig. 16.

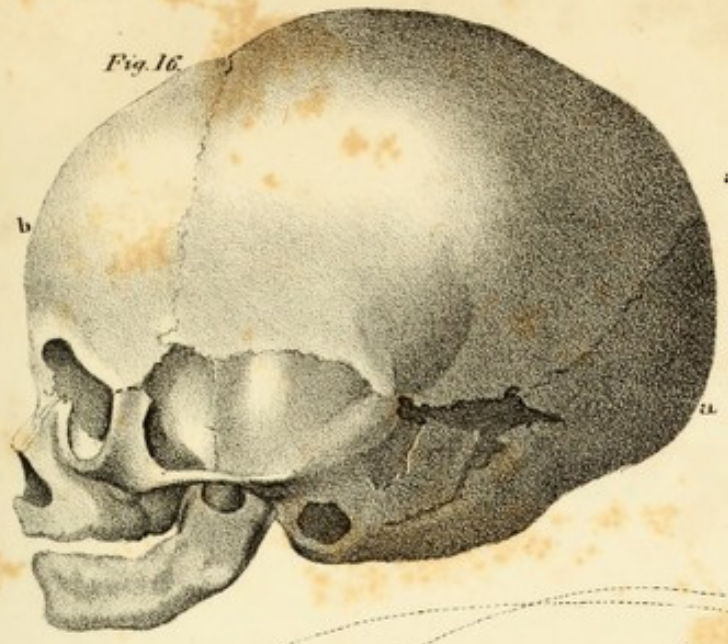
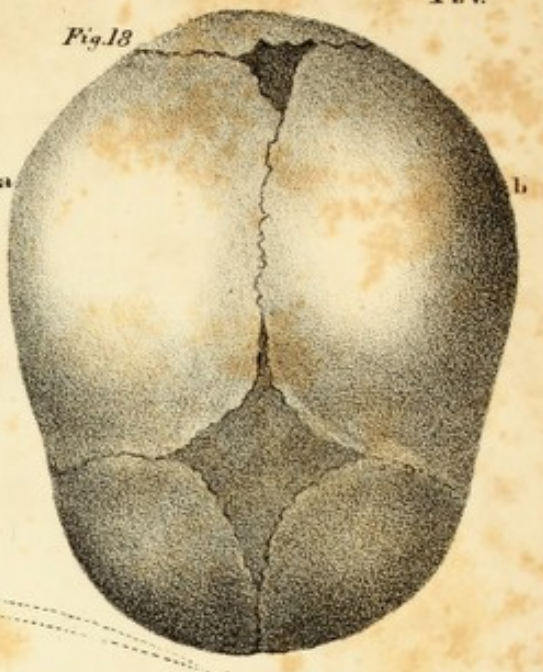


Fig. 18.



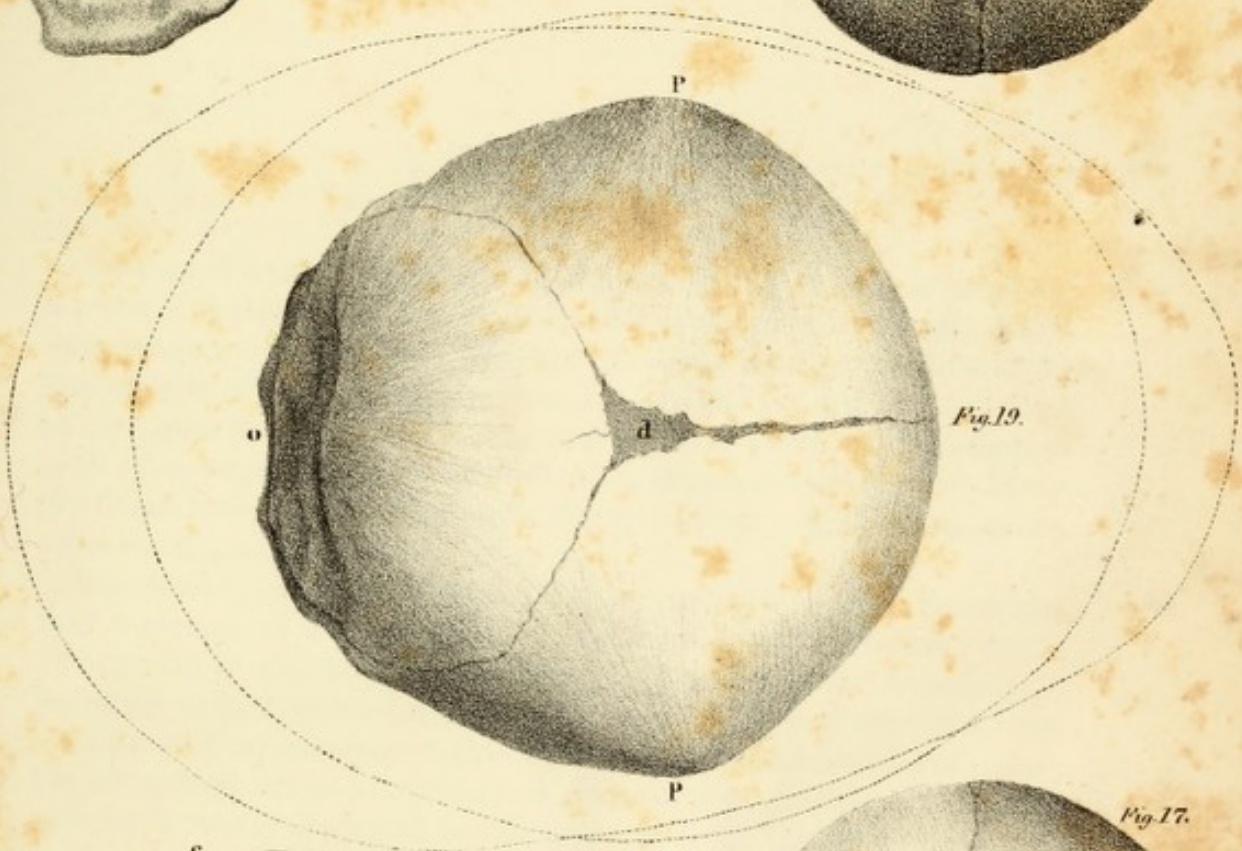


Fig. 19.

Fig. 17.



Fig. 15.



Sinclair's Lith. Phil.ª

OF DEFORMED PELVES.

Plates VI., VII., VIII.

Fortunate would it be for child-bearing women if they each possessed a pelvis of the figure and dimensions already given as the standard. Such, however, is by no means the case; and this organ is subject to great varieties, as well in form as size. It would, indeed, be difficult to select from all the preserved specimens in existence, any two which exactly resemble each other—agreeing minutely in shape, dimensions, and weight. Many are found to be much above the ordinary volume, and numbers, on the other hand, greatly below it.

The want of due capacity sometimes originates in natural formation; thus a woman of short stature, although of tolerable symmetry, might be expected to possess a diminutive pelvis; but this is far from being a universal, or even general remark. Again, the re-union of the bones after fractures will commonly occasion both distortion and contraction of space; but when there exists a deficiency of room to any great extent, the irregularity is mostly dependent on disease of the bones themselves.

If we look at the head of the child, and the cavity through which it has to traverse, in a mechanical point of view, (which we must do before we can arrive at a correct knowledge of the process of parturition, even in the simplest and most easy state,) we shall immediately perceive that *size*, as regards the head and the pelvis, is entirely a relative term; and that a pelvis preternaturally small, or a head unusually large, will each in practice occasion difficulty in the same degree as they deviate from the standard dimensions; so that it matters little whether the disproportion be the consequence of diseased action or any other cause; provided it exists,

to a certain extent, it must necessarily be productive of a protracted struggle.

There are two diseases particularly through which the pelvis suffers considerable deterioration in size, *rachitis* or *rickets*, a disorder of childhood,—and *mollities ossium* or *malacosteon*, one of adult age. In both these affections there is a want of due solidity in the osseous system throughout the whole body. The animal matter entering into the composition of the skeleton being in great excess, and the earthy matter in proportionate deficiency, the bones yield like softened wax; the regularity and beauty of the pelvic form, as well as of other bony cavities, is destroyed, and the miserable specimens of distortion portrayed in Plates VI., VII., and VIII., are the result.

Deformity may be partial or general,—partial when either of the parts, the brim, cavity, or outlet, is simply the subject of derangement,—general, when all these are more or less involved. If the vicious formation be confined to the brim, the diminution in size is almost always produced by the promontory of the sacrum jutting too far forwards, and by this means contracting the conjugate diameter; if to the cavity, by the sacrum being too straight, so that the bone does not possess its due curvature; if to the outlet, by the tuberosities of the ischia approaching too near each other; or by the spinous processes of the same bones being too long, and directed too much inwards; or again, by the joints of the coxyx having become anchelosed, and having thus lost their mobility. Of these irregularities the most frequent is that met with at the brim; the most rare, an undue straitness of the sacrum.

It is easy to account for the frequency of contraction at the brim, because the base of the sacrum supports the whole weight of the trunk, head, and upper extremities; and as the sacral promontory partakes of the curve forward proper to the lumbar vertebræ, it is reasonable to suppose, that if any degree of softness exists in the bones, they will bow at this point first, being unable to resist the superincumbent pressure. Giving way in this manner, the lowest lumbar vertebra, and the upper part of the sacrum, will be thrown inwards, so as to dip over the entrance to the pelvic cavity.

If we rest a perfectly straight wire perpendicularly on a table, and place a weight upon its top greater than it can sustain, it will bend, but at what part we cannot tell. If, however, we make the least elbow in it before we try the experiment, we shall find that it will yield there rather than in any other part. This is exactly analogous to the condition of the sacral promontory and last bone of the loins.

In Plate VI., figs. 20 and 21, two specimens are given of this kind of deformity at the brim. The original from which figure 20 was engraved,

Fig. 20.

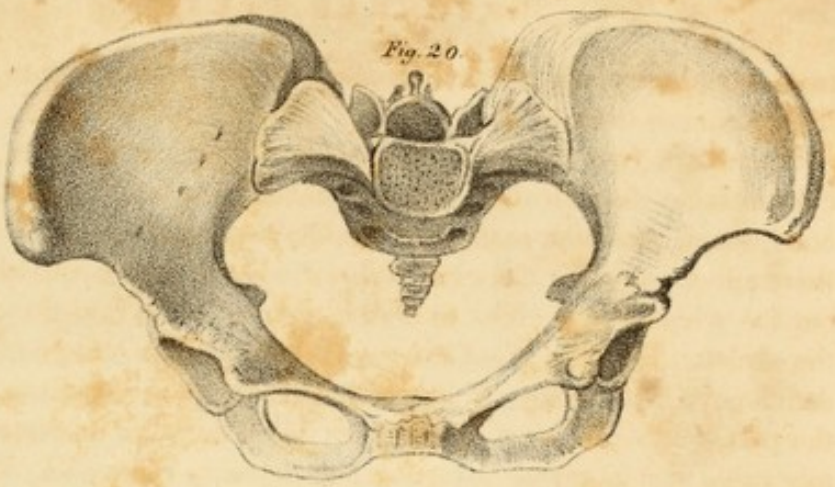


Fig. 21.

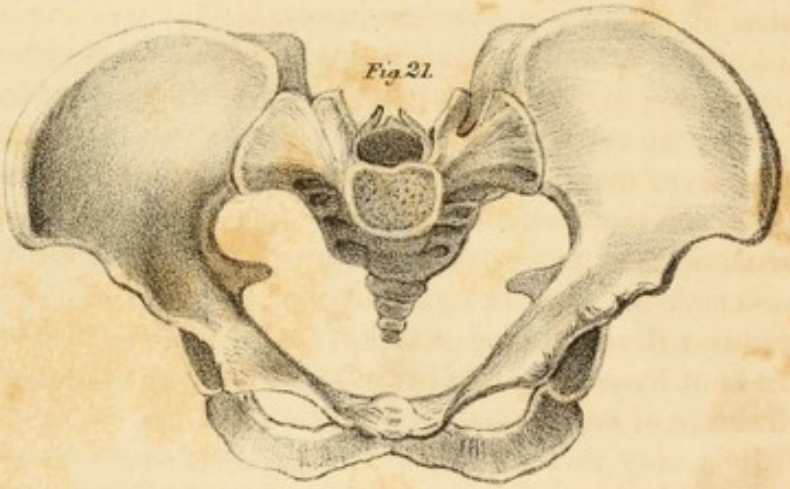


Fig. 22.



Sinclair's Lith. Phil.ª

is preserved in the London Hospital Museum: it measures five inches in the lateral diameter; two inches and three-quarters in the sacro-pubic; and the same from each side of the sacrum to the ramus of the pubes. This is just below the minimum space through which a full-grown fœtal head could pass entire; but the ischial tuberosities are four inches and three-eighths apart, the distance between them being full a quarter of an inch more than in a healthy pelvis, so that the outlet is wider than natural; and as the sacral curve is well proportioned, if the head once gained possession of the cavity, it would speedily, and with little farther exertion, be expelled.

Figure 21, represents the pelvis of a woman whom I delivered in a state of great exhaustion, under a primary labour by craniotomy; and is considerably contracted in all its dimensions, more especially at the brim. The diameter, from the centre of the prominence of the sacrum to the symphysis pubis, is only two inches and a quarter; the iliac diameter four inches and three-quarters; on the right side of the promontory of the sacrum to the pubic ramus, the space is two inches and a half; on the left side two inches and a quarter. The cavity is much below the natural size, the depth posteriorly being not more than four inches; the outlet also is considerably diminished, as well by the width between the ischia measuring only three inches and a quarter, as by the elongation of the spinous processes of those bones.

In most cases of partial deformity at the brim, the lateral diameter is increased in size nearly in the same proportion as the conjugate is diminished; but however much the width from ilium to ilium may exceed the ordinary dimensions, the increased space thus obtained will in no degree make amends for the diminution from the sacrum to the pubes; because it is necessary that there should not exist less than a certain quantity of available room in *every* direction to permit the child's transit.

When the deformity is complete by involving the cavity and outlet as well as the brim, it may be of two kinds—angular, as shown in Plates VI., fig. 22, and VII., fig. 23,—or elliptical, as in Plate VIII. figs. 26, 27. In the angular distortion the promontory of the sacrum is thrown forwards; the tuberosities of the ischia closely approach each other; and the symphysis pubis projects outwards. The pelvis bears the appearance as though it were formed of ductile matter, and the pubic bones at each side of their junction had been squeezed forcibly together. In the elliptical, the sacral prominence projects forwards; the tuberosities of the ischia are separated to a much wider extent than is usual; and the bones at the symphysis pubis are flattened, being forced back towards the sacrum; thus a greater lateral diameter is given both to the brim and the outlet.

It is generally believed that the elliptical species of distortion, Plate

VIII., is invariably the consequence of rickets; while the angular, Plates VI., fig. 22, and VII., fig. 23, is as invariably produced by mollities ossium; and Dr. Hull, in his second letter to Simmonds, has, by a very ingenious chain of reasoning, endeavoured to substantiate this hypothesis. I am far from subscribing to the universal truth of this doctrine; but am inclined to think that both these diseases may occasion each variety.

To render the subject more easily understood, I shall divide pelves into four gradations, and I shall classify them according to their form at the brim, since that is the part most usually, as well as most severely, distorted. The first embraces the standard pelvis—five inches and a quarter in the lateral diameter, by four in the conjugate, and all above that measurement, through which a mature fœtus will escape with facility.

The second class includes those lower than the standard, but sufficiently large to permit the child's passing alive, being either expelled by the unaided efforts of nature, or extracted by instruments which are perfectly compatible as well with its preservation as with the safety and integrity of the woman's structures. A live birth may be accomplished through a pelvis which possesses a clear available space of three inches in the conjugate, by four in the lateral diameter. Some practitioners have thought that a pelvis measuring only two inches and three-quarters in the conjugate diameter would allow of the head passing whole, provided there were sufficient room laterally. My own conviction, derived from clinical observation, is, that the dimensions I have just mentioned are the smallest which will grant a passage to a full-grown unmutilated fœtus.

In the third class is comprehended every pelvis of such a size as would admit of a well-educated practitioner extracting a fœtus through it, after the bulk has been diminished by cutting instruments to the smallest possible compass. Although most obstetricians agree that three inches by four is about the least space through which a full sized fœtal head will pass entire, there is an extraordinary difference of opinion in regard to this other question; some thinking that little more than an inch in the conjugate diameter will suffice; others, that very considerably more is required. This discrepancy may, perhaps, in some measure, be accounted for by the superior tact which long and constant practice in obstetrical operations gives; for it is reasonable to suppose that a person unaccustomed to these duties will not succeed so well as one to whom they occur frequently. It is left to me, therefore, to form a scale of my own as the lowest limit through which a child can be drawn after mutilation; and I am quite convinced that unless there be at the brim one inch and three eighths in the conjugate, by three and a half in the iliac, or one inch and a half in

Fig. 23.

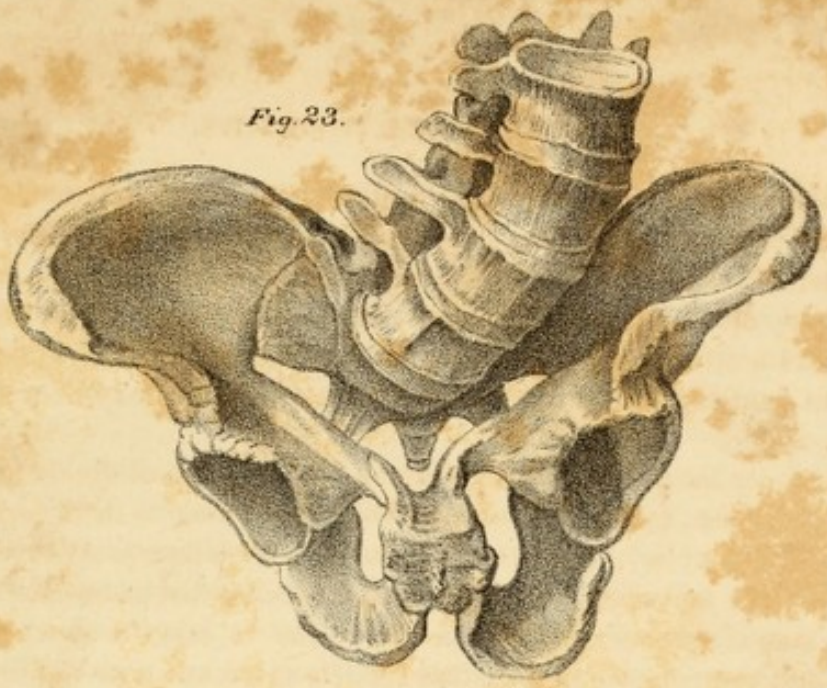


Fig 24.

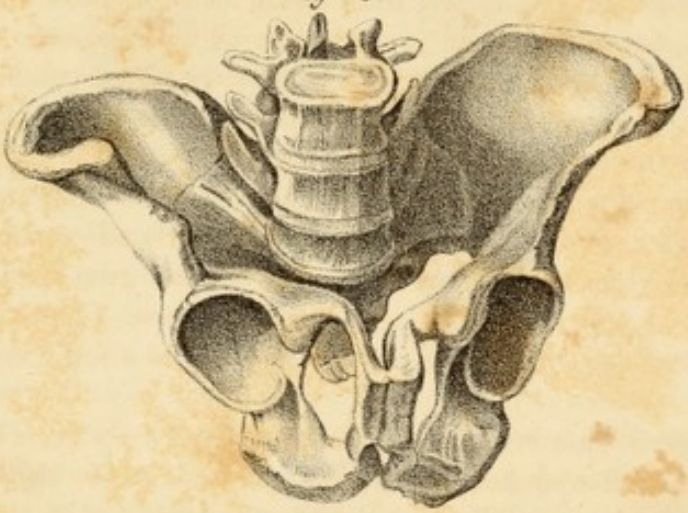
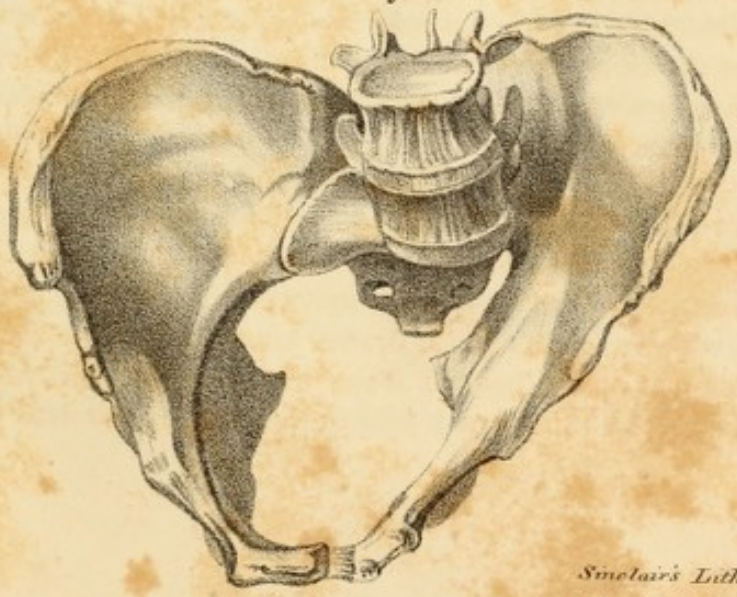


Fig. 25.



Smelair's Lith.

the conjugate, by three in the iliac, it would be useless to attempt delivery *per vias naturales;* but it will very rarely indeed be found that the lateral diameter at the brim does not exceed three inches. One point, however, should be borne in mind in making this computation, that if the brim alone be distorted, a much less amount of room is requisite for extraction than in cases where the cavity and outlet are proportionally lessened in their dimensions.

In the last class or gradation are to be included all pelves below the minimum space just mentioned; through which it is impossible for the most skilful and experienced operator to extract a fœtus, even after the brain has been evacuated, and the body diminished to the utmost extent that art can accomplish. In cases of such extreme deformity, no means remain of rescuing the woman from death through exhaustion but to open the abdomen, cut into the uterine cavity, and extract the fœtus by the artificial aperture; an operation horrible to contemplate, and which in the British islands has, with three exceptions, proved universally fatal to the mother.

The subjects for the plates have been selected with the view of illustrating the different positions laid down. The measurements of the two distorted pelves in Plate VIII., have been already given: through the upper, fig. 26, some obstetricians think it possible that a full-grown and commonly-ossified fœtal head might pass entire with great exertion, though I should much doubt it; through the lower, fig. 27, no mature fœtus of ordinary weight could be born alive.

In Plates VI. fig. 22, and VII. fig. 23, are given two specimens of the angular distortion. The brim of fig. 22, in its long diameter, measures four inches and a half; the greatest available space between the pubes and sacral promontory is one inch and five-eighths; on the left side of the promontory there are two and three-eighths; and on the right side two inches and a half. The tuberosities of the ischia at their nearest points approach each other to within an inch and three-fourths; and the distance between the tip of the coxyx and the under edge of the symphysis pubis is four inches and a half. It would be perfectly possible to deliver the patient who possessed this pelvis, by the operation of craniotomy.

Fig. 23, is a cast of the pelvis (now so well known from the copies having been multiplied to a great extent) of Isabel Redman, on whom Dr. Hull performed the Cæsarean operation on Sept. 22, 1794. A single glance will show its extreme deformity; to demonstrate which, it is only necessary to mention that a ball of one inch in diameter will not pass through the brim at any part. I believe this is the smallest pelvis, as far as regards the brim, on record.

Fig. 24, Plate VII. represents the bony pelvis of a woman, the subject

of one of the late Mr. Barlow's cases of the same operation; by whom the preparation was presented to me. From the junction of the fourth and fifth lumbar vertebræ (which is the most projecting point, in consequence of the sacral promontory being thrust down considerably lower than the level of the pubes) to the outer surface of the symphysis pubis, is three inches; the clear space within being, from the same point to the ramus of the pubes on the right side, seven-eighths of an inch, on the left side, an inch and three-eighths; from the same point to the acetabulum on the right side, three quarters of an inch, on the left side an inch and a quarter. The greatest quantity of available room in the antero-posterior diameter, is from the left side of the sacral promontory to the ilium, and measures an inch and a half. The greatest lateral space following the curve, is five inches and three-eighths; at the outlet, the ascending rami of the ischia are in close contact, and the centre of the tuberosities are an inch and a half distant; the sacrum just below its centre is curved at an acute angle upwards, so as to bring the apex of the coxyx to within an inch and a half of the promontory of that bone, and two and a half to the point where the two rami of the ischia touch each other. Although the operations undertaken in both these instances proved fatal, nobody can deny the necessity and propriety of their performance.

Fig. 25, in the same Plate, VII., is taken from the lithographic drawing in the work of M. Moreau, now in the course of publication. It is introduced here for its rarity. The original is in the anatomical collection in the Maison d'Accouchemens at Paris; but I have not been able to meet with a similar specimen in London. Two or three may be found in which a tendency to this figure exists, though in a very slight degree; and one is preserved in the University College Hospital that very much resembles it. That, however, is a male pelvis, and the deformity was occasioned by fracture; this is a female, and the cause was disease.

Plate VIII. demonstrates the elliptical variety of distortion from casts. In fig. 26, the distance between the symphysis pubis and sacrum is one inch and a half; on the right side of the sacral promontory in the antero-posterior diameter there are two inches; on the left side, only three-fourths of an inch. The lateral diameter of the brim following the curve in a central line equidistant from the sacrum and pubes, measures six inches and a quarter; at the outlet, the extreme width between the ischia is five inches and a half; from the apex of the coxyx to the under part of the symphysis pubis, four and a half. Through a pelvis of this form and size the fœtus might be extracted by the instruments adapted to craniotomy.

The original of fig. 27, is much smaller, and I fear, if such a conformation existed, the child could only be extricated by the abdominal incision.

In this instance, from the pubes to the sacrum measures no more than three-fourths of an inch; on the right side of the sacral promontory there is one inch and a quarter; on the left side, an inch and five eighths. At the outlet, the tuberosities of the ischia are four inches and an eighth asunder; but the space between the apex of the coxyx and the under part of the symphysis pubis is only two inches.

These examples will be sufficient to give an idea of the great alteration which the pelvis undergoes when its bony structure is attacked by disease; it is needless, therefore, to adduce a larger number.

Fig. 26.

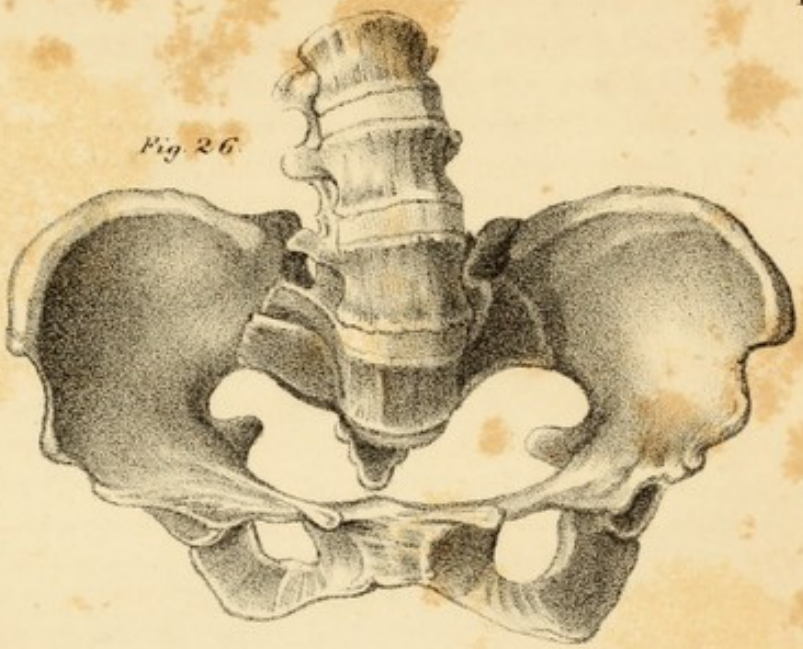
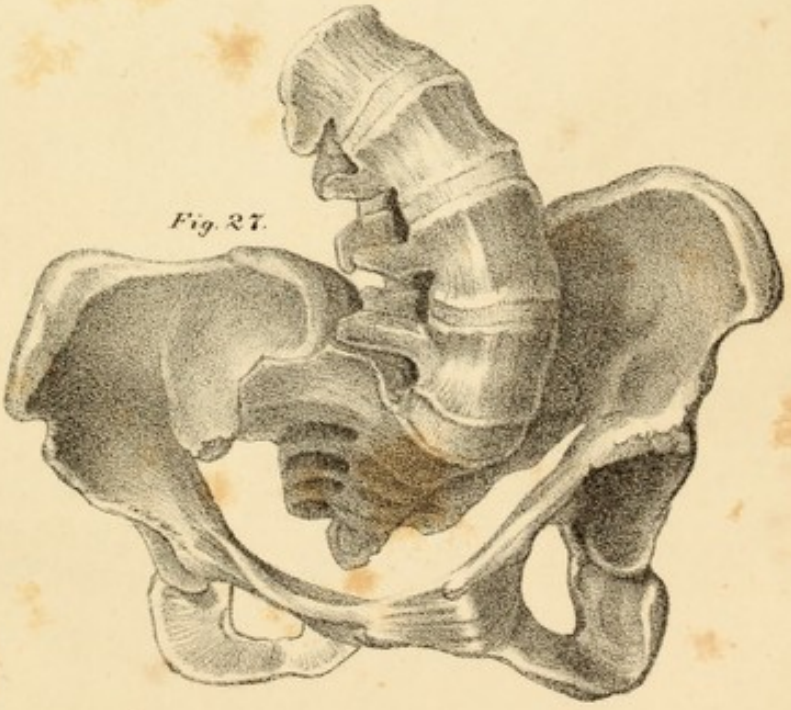


Fig. 27.



Sinclair's Lith.

OF PELVIMETERS.

Plate IX.

Much ingenuity has been displayed by our Gallic neighbours in the invention of instruments for the purpose of measuring the conjugate diameter of the pelvis at the brim; and Coutouli's pelvimeter, and Baudelocque's calipers, are those best known. The former consists of a flat base and a moveable slide, into which it is fitted; at the end of both the base and the slide a piece of metal projects at right angles. This instrument, indeed, resembles that by which shoemakers are accustomed to measure the length of the foot: it is to be introduced within the vagina; the extremity of the base is to be carried up to the promontory of the sacrum, and the projection at the end of the slide brought behind the symphysis pubis. By a scale which hangs out beyond the external parts, the space between the apex of the pubic arch and sacrum may be known. Making, then, an allowance for the difference between the oblique and direct diameter, it was supposed we might become acquainted with the actual available space there existing. This contrivance is easily adapted to a skeleton pelvis, and so would a common rule be; but its application when the soft parts are preserved, is difficult; and, from its straight figure, impossible, if any part of the child's head be engaged in the pelvic brim. As, therefore, that pelvis must be exceedingly distorted which would not allow the head to descend somewhat into the cavity, Coutouli's pelvimeter is found practically valueless.

The *compas d'epaisseurs*, or *calipers* of Baudelocque, are intended to be applied externally to the woman's person. They consist of a base or handle, formed of two parallel pieces, and joined at their lower extremity by a hinge; from the upper end of the handle two curved arms rise, having at their points two small buttons. One of these is to be placed upon the

outer surface of the symphysis pubis,—the mons veneris; and the other on the lower end of the loins, opposite to the sacral promontory. A scale of inches is adapted to the handle, and so calculated, that it is supposed to indicate the exact space between the promontory of the sacrum, and pubes within the pelvis. This may, perhaps, be perfectly true in regard to a standard pelvis, or one deviating but little from the ordinary size; but no person can regard the various specimens of deformity shown in the plates, without being perfectly convinced that, if taken as our guide in all cases of distortion, it would afford the most conflicting and erroneous results.

In Plate IX., fig. 28, the application of both these mechanical inventions is sufficiently well displayed to require no farther illustration.

Such contrivances for the purpose of measuring the pelvic brim have by no means met with the sanction of British practitioners in general; but they are in the habit of depending for this information on examinations conducted by the fingers, or the hand. Three methods are practised: one is, by the introduction of the first finger of the right hand within the vagina, so that the point should be carried up to and touch the sacral promontory, while the root of the finger is applied exactly under the symphysis pubis, at the upper part of the arch, Plate IX. fig. 29. It must be evident that this mode of inquiry will be of no avail unless the pelvis be greatly distorted,—considerably under three inches, indeed, in the conjugate diameter. For the ordinary length of the index finger along its inner edge, is less than three inches; and as the oblique line from the promontory to the apex of the pubic arch exceeds the direct line across, so if there be more than the space just mentioned, the finger would not be able to reach the projection, and we should consequently be in utter ignorance what amount of room existed. If the pelvis be very small, the sacral promontory can be felt with ease; but even in that case the dimension of the direct conjugate diameter is not afforded, but the length of the oblique line is given; and it is not always possible to calculate the difference between these two lines accurately.

Another mode which has been recommended is the introduction of the whole left hand within the pelvis, with the outside or point of the little finger touching the inner surface of the symphysis pubis, and the first finger placed against the promontory of the sacrum. As every man is aware what his hand measures across, it is supposed he will be able to ascertain the transverse width of the pelvis. Thus, presuming the hand to be two inches and three-quarters wide, which is the common average about the centre of the fingers, if, when placed edgeways, it just fits the brim, the examiner will know that the space is within three inches. Again, if he can only introduce three fingers instead of four, he will know that

the pelvis does not measure two inches, and probably not so much; and if he can only pass up two fingers, closed together, he will be assured that there is not more than an inch and three-eighths. But, on the contrary, if, on introducing the whole hand, he be compelled to spread his fingers widely before he can touch the sacral promontory, he will then be certain that the space is more than three inches, probably four, or near it. (Plate IX, fig. 30.)

But it is not always easy to follow this mode of inquiry, because the child's head is generally protruded somewhat into the pelvis, even when the brim is contracted; and we could not carry the hand up in this manner, and make the accurate examination which we require to do unless the brim as well as the cavity were perfectly free and unoccupied. It might, perhaps, be employed with advantage, provided the deformity were excessive.

The third method I consider the best, and is the one I myself adopt. Two fingers of the left hand are to be carried within the vagina; the extremity of the first finger is to be placed exactly behind the symphysis pubis, and the tip of the second against the sacral promontory. Plate IX, fig. 31. By stretching the fingers in this way, we shall have little difficulty in reaching the promontory of the sacrum, even when the pelvis is of ordinary dimensions; and by withdrawing them in the same position, we may measure off the distance between their extremities on the first finger of the right hand, or on a scale of inches, as with the limbs of a pair of compasses; and consequently we arrive at an accurate knowledge of the exact dimensions of the pelvic brim. The laxity of the vagina, and other soft structures, which almost invariably attends the process of labour, will permit the fingers to be withdrawn extended; and if the examiner uses sufficient care, they may be kept perfectly steady until the space which they embrace be ascertained.

This mode of proceeding possesses a great advantage over the other two, inasmuch as we are able equally well to make our examination, whether the head be occupying a part of the pelvic cavity, or whether it be still detained quite above the brim; for even if it be engaged in the vagina, one finger may be passed anterior to, and the other behind it, with comparative ease.

But although in most instances the brim demands the principal part of our attention, the shape and capacity of the cavity and outlet must not be neglected. To inform ourselves on these points, the fingers being gently carried along the hollow of the sacrum, notice must be taken of the degree of curvature which that bone possesses, and of the mobility of the coxyx. The width between the tuberosities of the ischia, as well as the inclina-

tion of the spinous processes, must also be made the subject of observation.

We may *suspect* that the pelvis is deformed if the spine be very much curved, and particularly if with that distortion the thigh-bones be bent considerably; for in such case we may fairly infer that the curvature of the spinal column has not arisen from any local disease of the vertebræ, but from some general constitutional affection, such as rickets, or mollities ossium; and when the system is influenced to any great extent by either of these diseases, we cannot expect that the pelvis will escape derangement.

It must be borne in mind, nevertheless, that any opinion we may entertain as to the pelvic capacity from the general form will, at the best, amount only to suspicion; for however crooked the spine may be, it by no means *necessarily* follows that the pelvis is distorted.

It is by internal examination alone,—and that during labour,—that we can obtain any *positive* information as to the state of the pelvis. We may, indeed, in cases of great deformity, even at other times, detect the projection of the sacral promontory, or the approximation of the ischia, by the introduction of one or two fingers into the vagina; but an accurate knowledge of the pelvic dimensions can only be gained when the soft structures are relaxed by the process of parturition.

Of preternaturally large pelves.—From what has been already advanced, it will be readily conceded that few greater evils could befall a child-bearing woman than to be the subject of a contracted pelvis; and it might be supposed, therefore, that the possession of a very large one was to be esteemed a great blessing. But this is far from being the case; and an organ much exceeding the standard proportions must be regarded as very liable to entail danger both on the mother and her offspring.

One of the most common accidents to which a woman with a preternaturally large pelvis is exposed, is the descent of the gravid womb. When a certain period of pregnancy has passed, the uterus, which before that time had remained within the pelvic cavity, rises by degrees through the brim, and occupies a portion of the abdomen. By this change in its situation, the viscera, blood-vessels, and nerves at the lower part of the trunk, are relieved from the pressure they had been previously exposed to. But whenever the pelvis is sufficiently capacious to give it lodgment for a longer duration than should be, it sinks by its own weight lower than it ought, and much inconvenience is felt from its subsidence. In some cases, moreover, the gravid womb has been known to prolapse beyond the external parts, hanging as a large tumour between the thighs,

inverting the vagina, and dragging down with it both the bladder and the rectum. Abortion is likely to be excited by such an occurrence; and thus a preternaturally large pelvis may lead both to the loss of the ovum, and to chronic and confirmed prolapsus uteri.

Another distressing and dangerous accident to which a woman possessing a very large pelvis is generally supposed to be peculiarly obnoxious, consists in the retroversion of the pregnant womb;—when the fundus, instead of mounting towards the abdomen, is turned back upon the promontory, or falls down into the hollow of the sacrum. To a certain extent, this position is true; for retroversion of the uterus is more likely to happen in a case of excessive capacity than where the organ is near the standard size. But by far the greater number of instances of this description which have come under my observation have been combined with a slight diminution of space in the conjugate diameter at the brim; and I am therefore, warranted in concluding that such a formation more frequently predisposes to this cause of danger than an undue capacity.

A third inconvenience, and one of no trifling importance, is the rapidity with which a fœtus will sometimes be expelled through a pelvis of extraordinary dimensions. Provided the os uteri be widely open, the other soft parts lax and distensible, and the uterine energies are exerted vigorously, the child may be expelled so quickly that no assistance can be rendered; under circumstances, too, in which both its own life and its mother's must be brought into imminent peril.

Fig. 29.



Fig. 28.

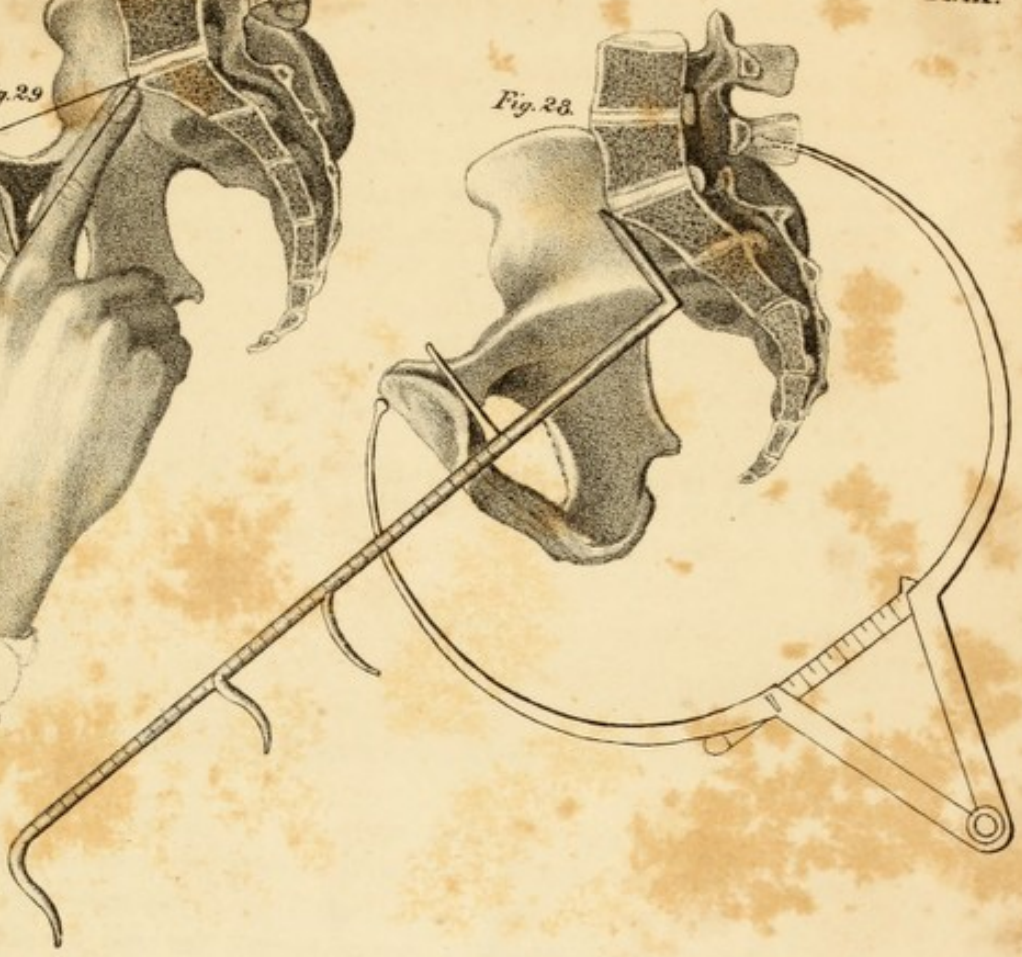


Fig. 31.



Fig. 30.



Sinclair's Lith.

FEMALE GENERATIVE ORGANS.

The female organs of generation are classed in two divisions—*external* and *internal.*

The external consist of the *mons veneris, labia externa, perineum, clitoris* with its *prepuce, nymphæ, vestibule, meatus urinarius, hymen* in virgins, and *carunculæ myrtiformes* in matrons.

The internal are, the *vagina, uterus,* and *uterine appendages;* which latter consists of *two broad ligaments, two round ligaments, two ovaries,* and *two fallopian tubes.*

EXTERNAL ORGANS.

Plate X.

At the lowest part of the abdomen, lying immediately over the pubes, is situated a soft cushion-like eminence, about three inches in breadth, and two in depth, called the MONS VENERIS, plate X., (*a.*) It is formed of a large quantity of loose cellular tissue, the interstices of which are filled up with much adipose matter; it is covered by the common cuticle of the body; and at puberty, studded with a number of short capilli, among the roots of which are embedded numerous mucous follicles.

Arising from the mons veneris, and running down perpendicularly, to unite at a junction below, there are two pouting lips, the LABIA EXTERNA, or LABIA PUDENDI, (*b.*) In length they are about three inches, and in structure they exactly resemble the mons veneris. The commissure at which

they join is called the FOURCHETTE, (*c.*) It is somewhat similar in appearance to the continuation of the skin at the roots of the fingers, and is the anterior boundary of the perineum.

THE PERINEUM (*d*) extends from the lower union of the labia externa back towards the anus (*e.*) Its structure is principally made up of highly distensible cellular membrane; it does not possess in its substance a great deal of fat, and the skin is but scantily furnished with hair. Its length is about an inch or an inch and a quarter in the quiescent state of the parts; but when the child's head is pressing externally in labour, it is capable of elongation to three, four, or even five inches; and in the same degree that it is extended in surface it becomes thinned in substance. It is to this part of the body that the obstetrician, during natural labour, is required to direct a principal part of his attention, for the purpose of preventing laceration and injury. These parts, closing and surrounding the genital fissure, altogether constitute the PUDENDUM.

On separating the labia externa, a line of demarcation is distinctly evident in each, where the skin of the body terminates, and the mucous membrane investing the organs within commences. This continuation of the mucous into the cuticular structure is exactly similar to the arrangement observable in the openings of other cavities—as the anus, nose, and male urethra. A hollow is also observed, which in the virgin is bounded posteriorly by the hymen. This has obtained the name of CONCHA, or FOSSA NAVICULARIS, and it contains within its precincts the clitoris with its prepuce, the nymphæ, the vestibule, and the meatus urinarius. The whole of the external parts together, as well those that are lined by mucous membrane, as those covered by the common cuticle, are called the VULVA.

THE CLITORIS, (*f,*) or rather that portion of it which is visible, is placed rather above and anterior to be lower edge of the symphysis pubis. In formation it bears a great analogy to the male penis: it resembles it, indeed, in every respect, except two—its small size, and its not being permeated by the urethra. Like the male penis, it is composed of *two crura*, which arise from the rami of the ischia and pubes, one on each side, run up to the junction of the bones at the symphysis, and there form the *corpora cavernosa*. These are also furnished with two muscles resembling the erectores penis in the male. At the extremity of the corpora cavernosa is placed the *glans;* this is the only part of the organ that we can observe by the eye, the others being embedded between the mucous membrane and the bone. Above the glans projects a duplicature or fold of membrane, covering it like a hood—apparantly for the purpose of protection —the PREPUTIUM CLITORIDIS, (*g.*) The clitoris is the most sensitive part of all the external organs. It is capable of distention, as the male penis is.

It is liberally supplied with blood from the pudic artery; and with nerves from branches of the pudic fasciculi.

Taking their origin from the clitoris, and sometimes arising from its prepuce, there are two other distinct folds of mucous membrane, which run parallel to the labia externa—the NYMPHÆ, or LABIA INTERNA (*h.*) They are nothing more than membranous rugæ—two layers connected by cellular substance—and at their termination they are ultimately lost in the lining membrane of the parts. They are mechanically opened out during the passage of the fœtal head in labour, and, by affording an increase of surface, assist in preventing laceration of the membrane.

Between the two nymphæ, running downwards and inwards round the lower edge of the symphysis pubis, and leading directly to the meatus urinarius, a smooth groove, of about an inch in length, is situated, termed the VESTIBULE, (*i.*) The surgeon will find it highly necessary to pay attention to this furrowed depression, because in the introduction of the catheter it guides his finger to the entrance of the urethra.

THE MEATUS URINARIUS, (*k,*) the mouth of the urethra, which is the canal leading to the bladder, is situated at the farther extremity of the vestibule. It is a small closed aperture, capable of admitting with ease the barrel of a goose quill; and is so distensible that a much larger cylinder can be introduced. It is essential that we become acquainted, not only with the situation of this aperture, but with the character which it affords to the touch; because when the bladder requires to be artificially evacuated, it is most desirable that the instrument used for that purpose should be passed in by the aid of the finger alone, without exposing the woman's person to the eye. This operation is frequently required, as well under labour as under different states of organic disease and functional derangement. In the more natural state of the parts we shall find the meatus to consist of an eminent, soft, circular rim, with a central depression, that would appear scarcely large enough to permit the insertion of a small wire; and if its position is borne in mind, a little practice will enable the student to introduce the catheter with facility. But when the structures are pressed upon by a long-continued lodgment of the child's head in the pelvis under labour, such a confusion is occasioned by their extension or tumefaction, that the peculiar character of this part is lost, and much difficulty may be experienced both in detecting it, and guiding the instrument into it. In such case, it is infinitely better to expose the patient to the inconvenience of an ocular inspection than to allow the bladder to become over-charged, to the imminent risk of its bursting, or to the no less probable chance of a fistulous orifice being formed between its neck and the vagina.

The Hymen* (*l*) is the posterior boundary of the fossa navicularis, and, placed at the entrance of the vagina, it divides the external from the internal organs. It consists of a very delicate membrane, generally of a semilunar shape, stretched directly across the parts, and having an aperture anteriorly. Sometimes, however, the opening is central, and serrated on its inner edge; at others, it possesses a number of small punctures, it is then called *cribriform;* and at others it is impervious, in which state, on the accession of puberty, it gives rise to many very distressing and dangerous symptoms, consequent on the retention behind it of the menstrual and other secretions.

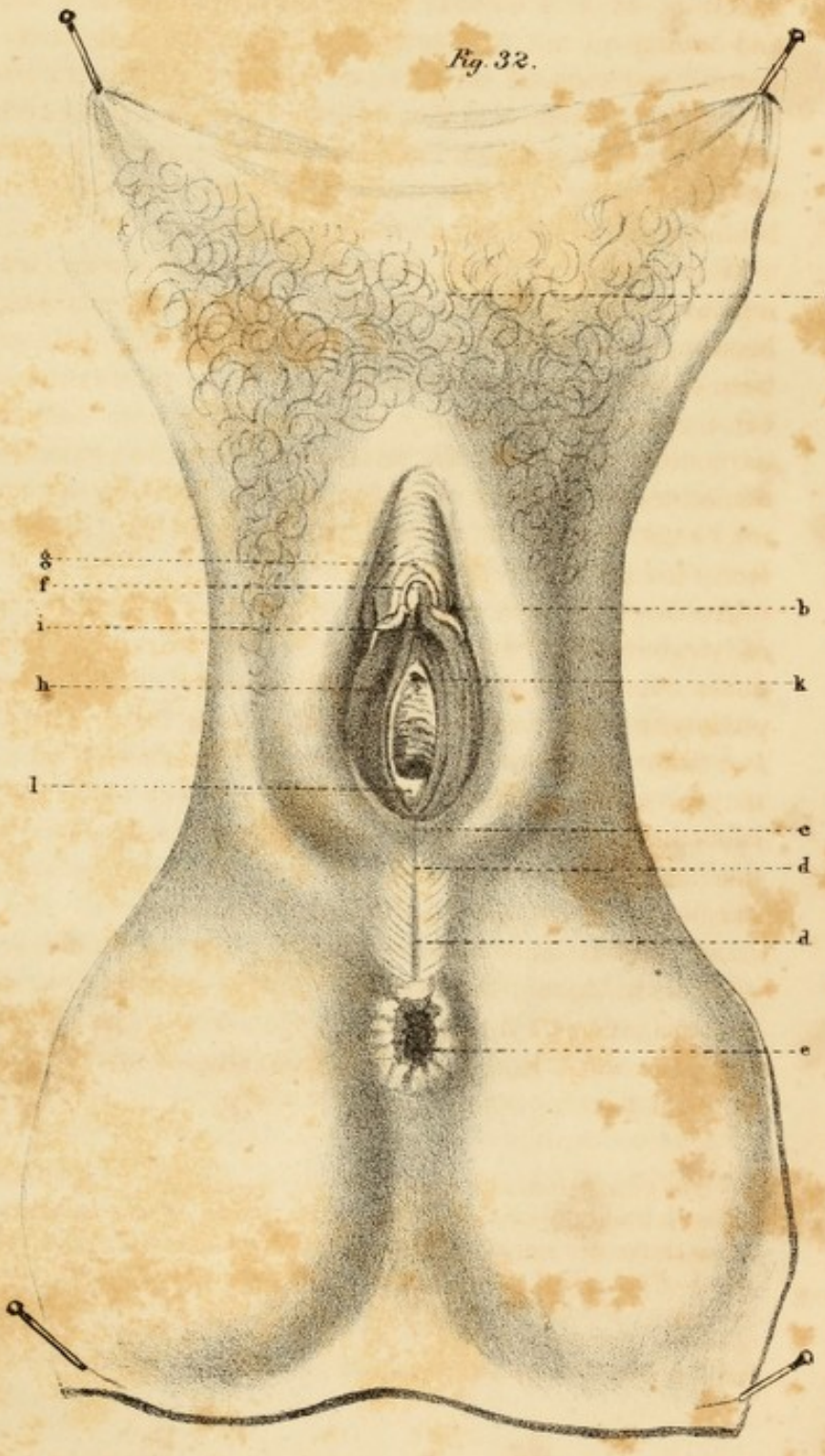
It is usually ruptured on the first sexual access, but by no means universally so. Upon its destruction the membrane disappears, and has been supposed to dwindle into a number of little eminences, which have been called, from their fancied resemblance to myrtle-berries, the carunculæ myrtiformes. Lately, however, it has been doubted whether these carunculæ were really the remains of the broken hymen; for it has been demonstrated by some physiologists, that both the hymen and carunculæ may exist together in the same subject, and that therefore they are perfectly independent formations.

Although the presence of the hymen was formerly considered as a test of virginity, from the supposition that it was invariably broken on the consummation of matrimonial intercourse, this idea has long been repudiated; for it is now well known, not only that it may be destroyed and lost from numerous causes originating in disease or accident, but also that in some instances it does not give way upon the first nor many subsequent connexions, and even that pregnancy has taken place while this membrane was entire. So that its presence can be no proof of personal chastity, nor its absence of immorality.

All organs immediately within the genital fissure are profusely supplied with blood from branches of the internal iliac arteries, and with nervous influence from the pudic filaments. The absorbent vessels, also, are both large and numerous, and communicate with the sacral and inguinal glands.

* The name hymen was adopted after the Greek word υμην, a membrane. From its bearing most frequently a crescent shape, this membrane has been fancifully pictured as the origin of the characteristic symbol of the virgin goddess Diana, as though she carried on her brow the stamp of her purity. It is a pretty poetical idea, but we can trace her typical figure to a much more probable source. Diana, in the beautiful poetry of the heathen mythology, was generally identified with Luna; and it is by far more likely that she derived this distinctive emblem from the crescent moon.

Fig. 32.



Sinclair's Lith.

INTERNAL ORGANS.

Plates XI., XII., XIII., XIV.

The Vagina, Plate XI. fig. 33, (*k*) and XIII., fig. 45, (*r*) is a musculo-membranous canal, running up the centre of the pelvis, leading from the external parts to the os uteri, in its progress describing a curve even greater than that of the sacrum and coxyx, having the neck of the bladder, the urethra, andthe symphysis pubis anteriorly, and the rectum behind it. In length it is about four or five inches; in circumference about three. It varies much, however, in different subjects, and is capable of extension to an extraordinary degree. In married women, and those who have had a family, it is considerably more capacious than in virgins; it is also wider in the middle than at either extremity, and longer on its posterior surface than anteriorly. It is composed of three coats—an external, cellular; a middle, muscular; and an internal, mucous. The external coat is merely a collection of condensed cellular structure, by which it is attached to the parts surrounding it. The middle coat is muscular, and the fibres follow different directions; some are longitudinal, some transverse, and some oblique. The muscular fibres are much more numerous at the commencement of the vagina than at any other part. Here they seem arranged in concentric circles, taking their origin from the sphincter ani, to which formation anatomists have given the name of *sphincter vaginæ*. The internal coat is mucous, and is a continuation of the membrane which lines the external parts; it is collected into transverse, or rather oblique rugæ; and from this circumstance it has also obtained the name of the *rugous coat* of the vagina.

These folds are much more apparent in the virgin, than in women who have borne children; and, like the muscular fibres, they are found in the greatest number at the lower end near the commencement. In the interstices of the rugæ are placed a number of follicles, which, independently of the mucus poured out by the vessels proper to the membrane itself, secrete a fluid of a peculiar character. The membrane is puckered thus, principally for the purpose of allowing the distention of the vagina during the passage of the child's head. The vaginal canal becomes much contracted in advanced life, and even in the virgin presents a smooth surface within, instead of the plicated membrane.

This organ is very plentifully supplied with blood-vessels, with nervous filaments, and absorbents. It obtains its blood through branches of the two uterine arteries, which are given off from the internal iliacs or hypogastrics. The common iliacs divide into two channels, the external and

internal; the internal descend into the pelvis, over the sacro-iliac syncondroses. From them arise the uterine arteries, which run up one on each side of the vagina, and in their course give off many transverse branches, which supply the vagina itself. Its nerves are principally derived from the sacral plexus; its veins accompany the arteries, and the absorbents pass in two directions, one division to the glands in the sacrum, and the other to those in the groin. The vagina is connected below with the external parts by a continuation of structure; anteriorly, with the symphysis pubis, the urethra, and the neck of the bladder, by cellular membrane; above, with the cervix uteri, and behind it is attached to the rectum. The commissure connecting the two organs is called by anatomists the *recto-vaginal septum*. It runs down, in connexion with the rectum, through a great part of its extent; but the vagina, at its lower end, turns at an angle forwards; while the rectum, just before terminating in the anus, is directed somewhat backwards, so that a space of about an inch in extent is left between them—the perineum.

The secretion of the vaginal membrane, in the ordinary healthy state of the parts, is almost exactly balanced by the natural absorption, so that there is little or no exudation externally; but under peculiar states of excitement under some diseases also, as well as under labour, the secretion much exceeds the absorption, and a discharge appears outwardly.

At the upper part of the vagina, hanging in the centre of the pelvis, behind the bladder and before the rectum, with its superior edge somewhat peeping up above the brim of the pelvis; supported in this situation by two ligaments which run from its sides to the ilea, and by the vagina, which is below, is situated the UTERUS, MATRIX, or WOMB, the organ destined to receive, to afford lodgment and nourishment to, and eventually to expel the ovum.

In shape the uterus is somewhat triangular, or rather like a flattened pear; and it is observed to be rounder on its posterior face than anteriorly, from which circumstance, in the unimpregnated state, we can always distinguish the right from the left side. In length, it is about three inches; in width, at the widest part, it is about two; and in thickness pretty nearly an inch. It varies, however, in different subjects, being in some degree larger in women who have borne many children, and smaller in virgins. Anatomists, for the facility of teaching, describe it as though it consisted of four parts; to the upper third, they give the name of *fundus*, to the middle, the name of *body*, and to the lower third that of *neck;* while its opening into the vagina they designate the *os uteri*, or *mouth of the womb*. The first three of these divisions are perfectly arbitrary; there is no septum in the uterus, no line of demarcation either externally or within, by which we can point out their limits; not so, however, with regard to the os uteri,

which is the means of its communication with the vagina—a natural aperture. Plate XI. fig. 34, shows the longitudinal section of the uterus; (*a*,) the fundus uteri; (*b*,) its body; (*c*,) the cervix; (*d*,) the os uteri; (*e*,) a small portion of the upper part of the vagina. The central line shows the direction of the cavity.

The uterus is covered externally by the peritoneum; it has a cavity which is lined by mucous membrane, and a peculiar parenchymatous structure between the two. The peritoneum, after having lined the abdominal muscles, rises over the bladder, giving a covering to a very considerable portion of that viscus; it then passes from the neck of the bladder directly backwards to the cervix uteri; it mounts over the uterus, and descends on the back part somewhat lower than in front, dipping even a little beneath the os uteri, affording an external coat to a very small portion of the vagina, and separating the uterus entirely from the rectum; it is then continued from the upper part of the vagina to the lower gut, and ascends to embrace the bowels. From the sides of the uterus processes are sent off, which constitute the broad ligaments.

The parenchymatous structure of this organ is of a very dense character, in appearance much resembling a half-tanned hide. On making a section of it, we observe a great number of very minute tortuous vessels running throughout its whole substance; in the unimpregnated state they are scarcely capacious enough to receive the finest injection; but they take upon themselves a process of growth as soon as conception has occurred; and towards the end of pregnancy many of them are sufficiently large in calibre to admit the introduction of a goose quill.

The uterus is generally considered by anatomists of the present day as a muscular organ; and, although this has been doubted by some respectable physiologists, it is now usually classed among the hollow muscles of the body.

This viscus contains a cavity which is lined by mucous membrane, being a continuation of that lining the vagina. The membrane is puckered into longitudinal or arborescent striæ towards the mouth of the womb, more evident in the virgin than in women who have had children, Plate XI. fig. 36, (*b*.) This formation is denominated the *arbor vitæ*. In the infant, the whole inner membrane is corrugated.

Figure 35 Plate XI., shows the infantile uterus laid open; (*a*,) the inner membrane of the uterus; (*b*,) the os uteri; (*c*,) the upper part of the vagina.

The cavity of the uterus is somewhat similar in shape to its external form; it is rather triangular, and large enough to contain a split almond. Into it three apertures open;—two at the angles of the fundus, the uterine extremities of the fallopian tubes, and one below, communicating with the

vagina—the mouth of the womb. The fallopian tubes do not enter the uterus in a straight line, opposite to each other, but obliquely; from which arrangement, two bristles passed along the tubes cross each other at a considerable angle when received into the cavity. Fig. 36, displays the uterine cavity laid open;—(*a*,) the os uteri; (*b*,) the cervix; the longitudinal lines show the appearance called arbor vitæ; (*c*,) the uterine extremities of the fallopian tubes, with a bristle inserted into each.

The opening into the vagina is called the *os uteri, os tincæ,** *os internum,* or the *mouth of the womb,* and by it a free communication is permitted between the cavities of the vagina and the uterus. But it must not be supposed that the uterus is connected with the vagina by a direct continuation of their separate structures; on the contrary, the vaginal coats run up a few lines above the orifice, to terminate at the cervix uteri; and the mucous membrane is reflected over its mouth, to line it within; so that the os uteri pouts and projects somewhat into the vagina, at an angle, looking considerably backwards, towards the centre of the hollow of the sacrum, Plate XIII. fig. 45, (*q*.) In the adult subject, the os uteri is of an oval shape, the slit being lateral, so that it is divided into an anterior and posterior lip. In the virgin it will with difficulty admit the extremity of a flattened catheter; but it is generally more dilated in women who have had children, in whom also it is often fissured. Thickly studding the os uteri, as also the cervix, we observe a number of follicles, called *glandulæ Nabothi,* Plate XX. figs. 68, 69, 70. These are scarcely perceptible in the healthy uterus of the virgin; but they enlarge much under pregnancy, during which state they become very evident to the eye. With this increase of size, a new office is afforded them; they pour out a thick, tough, pellucid, gelatinous mucus in considerable quantities, which blocks up the entrance to the cavity of the uterus, and breaks off the communication between it and the vagina; and as long as this mucus remains *in situ,* no fluid can be injected into the uterus. Plate XVI. fig. 56, is designed to show the appearance of this mucus at the cervix uteri.

The uterus is very liberally supplied with blood-vessels, with nerves and absorbents. The arteries are from two sources; one set, the *spermatic,* descend from the aorta, below the renal arteries, sometimes by one trunk from the anterior part of that vessel, and sometimes by two, one on each side: at others, they have been known to take their origin from the renal arteries. They descend with the same tortuous inflections as the spermatic vessels in the male, supply the ovaries, and afterwards run along the broad ligaments, to expend themselves in the uterus;—the other, the *uterine,* are given off from the internal iliacs, and anastomose very freely

* *Os tincæ,* from its fancied resemblance to the mouth of a tench fish.

Fig. 33.

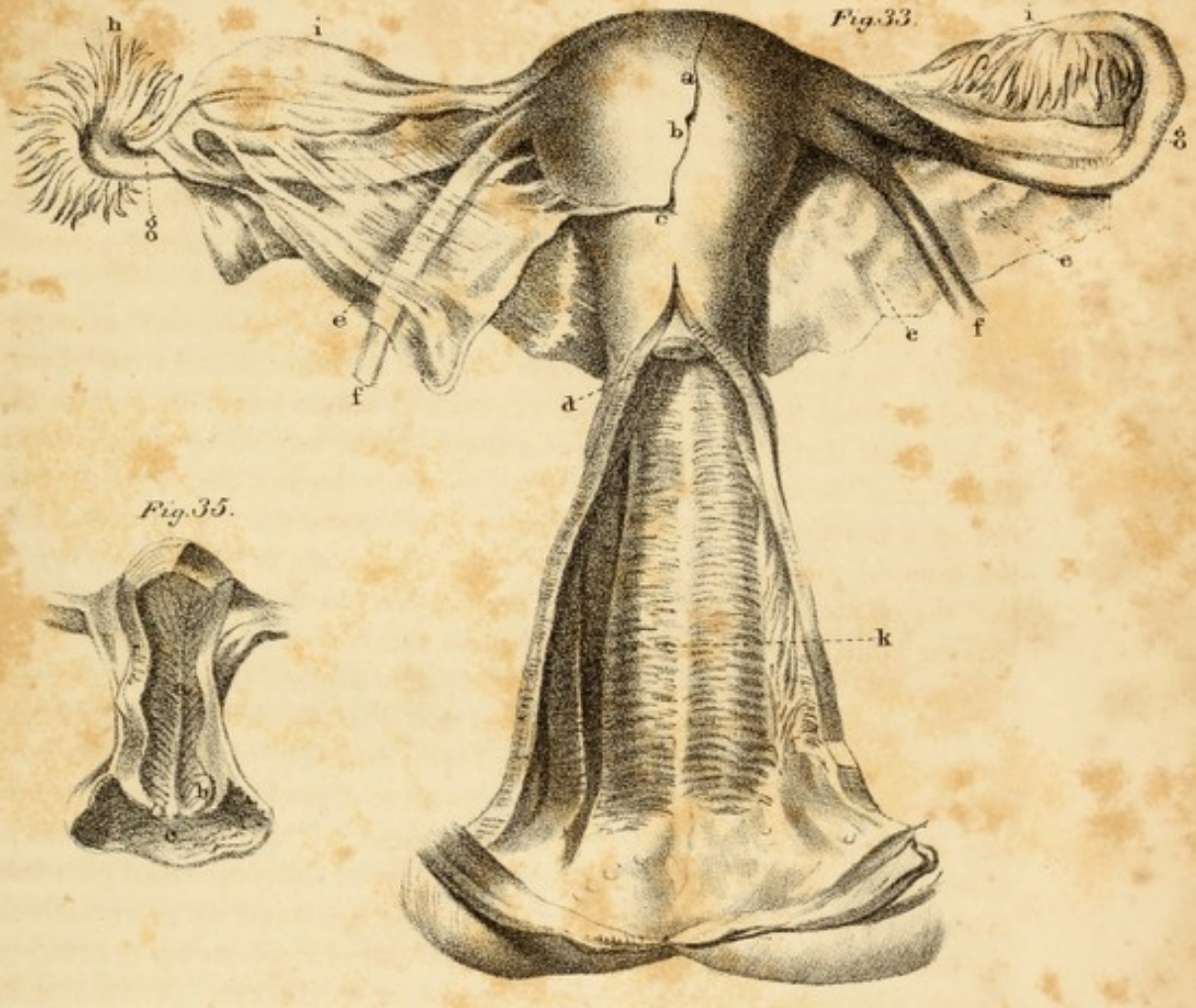


Fig. 35.

Fig. 36.

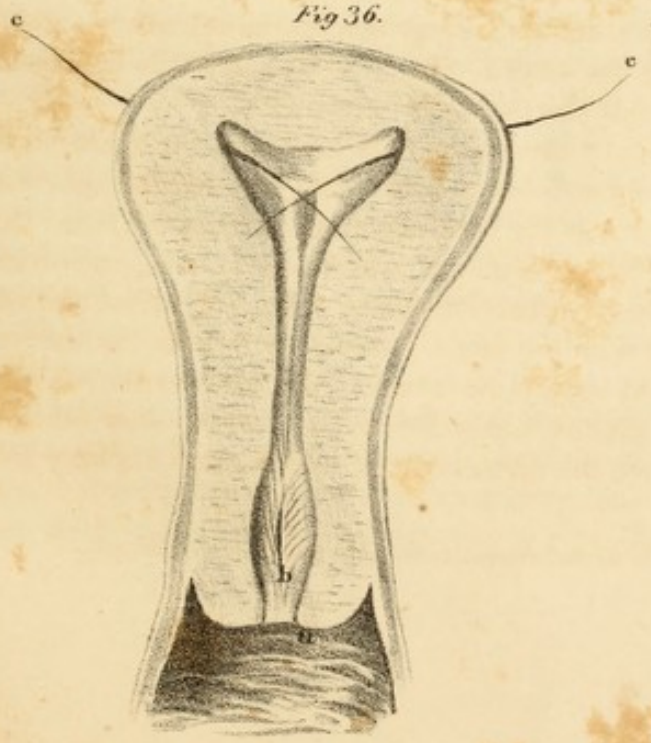


Fig. 34.



Sinclair's Lith.

with the uterine branches of the spermatic. By these two sets of vessels, a very copious supply of blood is allowed—one originating high up in the loins, and the other low down in the pelvis. The veins follow the course of their respective arteries. The spermatic have the same termination as the spermatic veins in the male—the right in the inferior cava, the left in the renal vein. The uterine veins empty themselves into the internal iliacs. The nerves also are from two sources: one supply is derived from the sacral plexus of the cerebro-spinal system, the other from the great sympathetic; and it is through the filaments of the latter nerve that most of the vital organs of the body, especially the stomach, sympathize so completely with the uterus, as well under disease as under pregnancy. The absorbents also run in two directions, one into the lumbar and sacral glands, and the other through the round ligament into the glands of the groin. The connexions of this organ are with the sides of the pelvis, by the broad ligaments which principally support it; with the vagina inferiorly; with the neck of the bladder anteriorly, by cellular substance; and with the groin, by means of the round ligament. It cannot be said to be connected with the rectum, because the peritoneum dips down sufficiently low to separate it perfectly from that gut, giving an outward tunic to a small portion of the upper part of the vagina. In this respect the posterior differs materially from the anterior surface of the uterus, because there is a direct connexion in front between the cervix uteri and the neck of the bladder by cellular tissue.

From each side of the uterus two duplicatures of the peritoneum extend to the ilea. They are called the BROAD LIGAMENTS, and sometimes, from their shape—since they are fancifully supposed to spread out somewhat like the wings of a bat—the ALÆ VESPERTILIONIS. They contain the fallopian tubes, which run on their upper margin; the ovaries, which are enclosed in a posterior fold; the round ligaments on their anterior face; and blood-vessels, nerves, and absorbents, destined to supply the uterus itself. These ligaments are well seen in Plate XI. fig. 33, (*e e*;) the right is shown in Plate XIII. fig. 45, (*m*.) There is also another double extension of the peritoneum on each side, not usually described by anatomists, arising from the angle of the fundus uteri, and running backwards to the sacrum and lumbar vertebræ. These, in conjunction with the lateral ligaments, are for the purpose of supporting the uterus in its situation, while hanging in the centre of the pelvis, and of guiding it in its ascent to the abdomen during the middle months of pregnancy, Plate XIII. fig. 46, (*h h*.)

Dangling somewhat loosely between the duplicatures of the broad ligament posteriorly, at the distance of about an inch and a half from the edge of the uterus, on each side, are placed the OVARIA, Plates XI. fig. 33, (*i i*,) XIII. fig. 45, (*l l*,) and fig. 46, (*g g*.) They are oval, glandular

bodies, about the size of a large almond; and previously to the time of Steno, who first asserted that they were analogous to true ovaria, they were called the FEMALE TESTES. Enclosed within this fold, they obtain their external covering from the peritoneum; their surface in consequence is smooth and shining. Besides the peritoneal coat, they possess beneath it another,—their proper tunic; and an impervious cord extends from each to the side of the uterus,—the ligament of the ovary. When a section is made, their structure is found to consist of dense cellular tissue, in which is imbedded a number of small cavities or vesicles, varying in size from the minutest pin's head to that of a large shot, the lesser being within, the larger more towards the surface. The fluid which these cavities contain is pellucid and coagulable by alcohol, heat, and the strong acids—composed, therefore, principally of albumen. In number they vary from twelve to fifteen in each ovarium. They are called, after De Graaf, *vesiculæ Graafianæ*. We may remark them sometimes rather eminent upon the surface. In the course of my dissections, I have occasionally seen two or three projecting under the peritoneum, studding the external face of the gland like beautiful little pearls, and on pricking them the fluid has exuded. We do not see these vesicles at all before puberty; they disappear, or become altered towards the close of life, when the gland is shrivelled by age; and are found in the greatest number, and most apparent, in the adult virgin. The vesiculæ Graafianæ contain whatever the female supplies towards the formation of the embryo. The late researches, indeed, of the talented and indefatigable Baer have detected in the vesicle before impregnation a minute body of spheroidal shape, which is admitted by those physiologists who have most deeply studied the subject since this discovery was made, to be perfectly similar in all its essential qualities to the ovum of birds and other ovipara. It is presumed to be the germ from whence will spring the future man, being vivified by the mysterious agency of the male semen during the process of conception.

Corpus Luteum.—In the ovary of a woman recently pregnant, we observe, besides these vesicles, a vascular spot about the size of a large pea or small bean, containing a central cavity, sometimes empty, at others filled with coagula, the consequence of the late conception. It is somewhat fabiform, of a dull yellow tint, resembling in hue the buffy coat of the blood, and when newly exposed, slightly red. The name CORPUS LUTEUM was given to it by Malpighi, from its colour; it had been previously called by De Graaf CORPUS GLANDULOSUM, for it possesses much of a gland-like appearance. Hunter, indeed, described it as "tender and friable, like glandular flesh." Rœderer compares its structure to that of the suprarenal capsules of the fœtus; and Montgomery speaks of it as "obviously and strikingly glandular." Corresponding with its situation externally,

there is observable a distinct cicatrix on the surface of the ovary, indicating the spot through which the fluid contained in the Graafian vesicle has escaped into the fallopian tube. The aperture has, in some rare instances, been found still pervious, when the conception was very recent.

The corpus luteum will present different appearances according to the length of time that has elapsed since impregnation. In the early weeks, that portion of peritoneum which covers it projects considerably beyond the surrounding surface, and minute vessels are seen ramifying over it, Plate XII, fig. 38. On dividing it, the central cavity is clearly distinguishable, of a tolerably regular, circular figure, around which is deposited the peculiar substance that forms its principal, essential constituent—yellowish, and possessing numerous thread-like vessels ramifying through it, fig. 39. As gestation advances, the regularity of the central cavity is destroyed, figs. 40, and 41; it diminishes in size; the newly-secreted yellow matter becomes plicated and absorbed, till at last the walls of the cyst, gradually collapsing, are brought into close contact, and a radiated or star-shaped series of lines is all that remains of the former cavity, fig. 43. During this process, both the vascularity and external projection are day by day decreasing, and the ovary is being restored to its former volume and appearance.

The length of time during which the corpus luteum continues visible, is not exactly ascertained, and probably it varies considerably according to circumstances. Montgomery has found the central cavity existing in the sixth month from impregnation; and the corpus luteum distinguishable at the end of five months from mature delivery, but never beyond that time. From the observations of Dr. Paterson, indeed, (Edin. Med. Journal, Jan., 1840,) it would appear that positive evidence of the existence of this body is rarely met with, even three or four months after labour; so that the common idea that this is a permanent structure, and that an examination of the ovaries after death will enable us to tell the exact number of children which any woman has borne, from the number of corpora lutea existing in her ovaries, is quite erroneous.

The formation of this body is explained in the following manner. It has been demonstrated that the Graafian vesicle possesses two membranes, one adhering to the substance of the ovary, the other enclosing the fluid in which the ovule of Baer floats. When a fruitful connexion takes place, a great determination of blood is made to that ovary which supplies the germ. The gland becomes larger, rounder, and more vascular, than the other; to the touch it feels fuller and softer. But the vascularity is confined to one spot,—the neighbourhood of the corpus luteum; and the increased size and softness result not so much from an alteration in the structure of the whole organ, as from the quantity of lymph and fluid

blood deposited between the membranes of the vesicle, which is converted into the characteristic yellow gland-like mass.* This effusion causes the vesicle to be thrown prominently out towards the peritoneal surface; the attenuated coats burst, or rather an opening is formed by absorption, and the fluid previously contained within them passes into the tube.

False Corpora Lutea. The remark of Haller, that "*conception never happens without the production of a corpus luteum,*" has, I believe, never been disputed; but his other proposition, that "*the corpus luteum is never found in virgin animals, but is the effect of impregnation alone,*" has been canvassed very extensively. Some physiologists have supposed that true corpora lutea, or bodies analogous in appearance to them, can be formed in the ovaries of virgins; while others have expressed themselves so vaguely on the subject, as to leave their opinions in great doubt. The possibility of such an occurrence is a question of first-rate importance in many medico-legal investigations; and consequently, it is incumbent on every one who touches upon this subject to endeavour to put it in a clear light.

It is perfectly true that spots of various size, shape, colour, and consistence, are met with in the virgin ovary of all animals, differing essentially from the surrounding tissue; but it is equally true that in structure they are very unlike that new product, the result of impregnation; and with care the one may always be distinguished from the other. The *real corpus luteum,* in the early weeks after conception, possesses a tolerably regular circular cavity, sometimes unoccupied, at others filled with the blood which was extravasated at the time when the coats of the vesicle gave way—at the moment, indeed, of impregnation. It is vascular, and its vascularity may be shown by injection. Its two coats may be distinctly traced, and the buff-coloured, lymphy deposite, in which newly-formed vessels ramify, may be observed between them. One only is ever found at the same time except the woman had conceived of twins, or had aborted very lately, before the last impregnation. The ovary on its external surface, above the spot where the body is situated within, is vascular and more prominent than at the other parts, fig. 38. There is a cicatrix very evident at the same point. In the more advanced stage, the central cavity is contracted, and at length becomes destroyed, and in its place is seen the radiated or stellated lines already mentioned, which is then its best distinguishing mark, fig. 43. The luteum itself diminishes in size in proportion to the distance of time from conception.

* Professor Baer, De Ovi Mammalium et Hominis Genesi, thinks that the corpus luteum is produced by a thickening of the inner membrane of the Graafian vesicle; and Dr. R. Lee, Med. Chirurg. Trans., vol. xxii., that it is formed outside of both the membranes. My own opinion coincides with that of Drs. Montgomery and Paterson.



Sinclair's Lith.

On the contrary, the *spurious, false,* or *virgin corpora lutea,* as they have been incorrectly termed, are of various shapes, sometimes triangular, at others square, offering no regular or definite figure, fig. 42. They have no vessels in their substance, and consequently cannot be injected, fig. 44. Although they possess two coats, they are entirely destitute of the interstitial, lymphy deposite. Their texture is often so wanting in firmness, as to be easily broken down. Several are frequently found in both ovaries at the same time. The peritoneum covering them does not present either prominence, or any appearance of vascularity, and the external cicatrix is seldom met with. They never contain the perfectly-regular central cavity, nor the stelliform, or radiated white lines, which result from the closing of the cavity.*

In advanced life, the ovaries become shrivelled, corrugated on their surface, firmer in their texture, and often contain empty collapsed cysts, with thickened, opake coats, so strong that they can be turned out of their bed entire. These have been mistaken for, and described as, corpora lutea; but after the account already given, it must be evident that such is not the case. There is little doubt that they are Graafian vesicles altered by age.

That the ovarium supplies whatever the female provides towards the formation of the new being, is proved by spaying animals, an operation which consists in taking away the ovaries. If one ovary only is removed from a multiparient animal, she becomes less fruitful. Hunter, after having deprived a sow of one, found that she furrowed six less than another animal of the same age. But when both these bodies are removed, the subject has no longer any desire for copulation, loses the characteristics

* The drawings in Plate XII. are copied from Montgomery's excellent work on the Signs and Symptoms of Pregnancy, and are of the natural size. Figs. 37, 38, 39, are taken from the ovaries of a woman who died when three months pregnant. Fig. 37, shows the appearance of that which had not contributed to conception; fig. 38, the external surface of the one which had furnished the germ, and which is enlarged by containing the corpus luteum. The vascularity of that portion surmounting the corpus luteum is beautifully displayed. In fig. 39, the same ovary is opened, and shows its internal structure, the lymph effused between the coats, its high vascularity, and its central cavity, which had previously contained the fluid. Fig. 40 is the corpus luteum in the fourth month opened, showing the vessels running through its substance, and the central cavity unusually large for that period of gestation. Fig. 41, the appearance in the sixth month, the corpus luteum still retaining its central cavity, which is unusual at so late a period. Fig. 43, the ovary of a woman who died sixteen days after mature delivery, exhibiting the corpus luteum with its stellated central white line, and a few small vessels in its structure. Fig. 42, an ovary opened, containing spurious or virgin corpora lutea, which possess neither the appearance of a separated double membrane, nor stellated lines, nor any vessels in their structure. Fig. 44 is also an ovary containing spurious corpora lutea. It was injected with care, but none of the colouring matter entered the spurious products, which were destitute of vessels.

of her sex, and assumes more or less those of the male. This is remarked in all animals, but is particularly observable in the feathered tribes. If the ovaries be removed from a common domestic hen, she soon becomes decked with somewhat of the cock's plumage, her voice is changed, and instead of her usual cackle, she utters an imperfect crow. The female of the human subject ceases to menstruate; long straggling hairs grow upon the chin; the breasts become flabby, being deprived of part both of their fat and glandular structure; the skin loses its soft smoothness; the voice becomes harsh and discordant; and the individual might easily be mistaken for a male. Nor are the moral less influenced than the physical properties: sexual feelings are destroyed, and the delicacy of the female character disappears. This change was strictly exemplified in Mr. Pott's celebrated case, where both ovaries were removed in an operation for hernia. Similar results, indeed, take place, as are observed after castration of the male: so that to the presence of these little glands the female is as much indebted for the distinctive physical marks and moral attributes of her sex, as the male is to the possession of the testes.

Although I have followed the ordinary usage in describing the ovaries as appendages to the uterus, the uterus ought in truth to be considered as an appendage to them; in the same way as the penis may be considered an appendage to the testes. For they are the most essential organs in the function of generation. The uterus may be diseased to a great extent, and yet the woman may be fruitful; but if both these glands are much altered in structure, barrenness necessarily ensues. An ovary, indeed, or something analogous to it, is found throughout the whole of the sexual genera of both animals and plants.

Running along the upper edge of each broad ligament there is a pervious canal, having two open extremities—one end communicating with the uterine, the other with the peritoneal cavities: to these the name of FALLOPIAN TUBES has been given, after their first describer. They are about four inches in length; they are covered externally by the peritoneum: possess a middle coat of muscular fibres, which run longitudinally, transversely, and obliquely, and an internal mucous coat, a continuation of the mucous membrane lining the uterus. At the abdominal extremity they are fringed, Plate XI. fig. 33, (*h.*;) XIII. fig. 45, (*o. o.*;) XIII. fig. 46, (*f. f.*) and float loose and unconnected; this part of the tube is called the *fimbriated* extremity, and in old works, from its office, the *morsus Diaboli*. The mucous membrane which lines the tube is continued to the *fimbriæ*, and it is the only instance in the body where a mucous and a serous membrane join by continuation of structure—the only example of a mucous membrane terminating in a shut cavity.

It is through this tube that the ovum, after impregnation, passes into

the uterine cavity; and the mode in which it is affected is supposed to be the following. By its own inherent muscular power, the Fallopian tube under the venereal orgasm, erects itself somewhat like a snake raising its crest. By the same inherent muscular power it directs itself to the ovarium, it widely spreads its fimbriæ, expands itself upon the external surface of the gland, closely embraces it, and squeezes from it the contents of one or more of the vesicles of De Graaf. Plate XI. fig. 33, (*i.*) Freighted with their living burden, the fimbriæ approximate each other, close the orifice, before wide spreading and patulous; and a motion somewhat like the peristaltic action of the intestinal canal is then set up in the tube, by which means the ovum, now impregnated, traverses the length of the canal until it drops into the uterine cavity. We have both negative and positive proof of the strongest kind, that the ovum passes through the Fallopian tube before it arrives at the uterus—*negative*, because there is no other canal through which it can be conveyed, there being no direct communication between the ovarium and the uterus; *negative*, also, because, if we cut away a portion of the Fallopian tube from each side, so as to destroy the continuity of the canal, we prevent conception, although we do not take away the desire for copulation;—but farther, we have *positive* proof because an impregnated ovum has been frequently found within the tube; it has been arrested in its transit, formed a bed for itself within the dilated canal, and there grown; constituting a species of that disease termed *extra-uterine conception*. Thus we cannot for a moment doubt that the ovum travels along the Fallopian tube to gain the uterine cavity. The sensation communicated to the finger by squeezing the tube is very much like that of the spermatic cord. It is hard, firm, and wiry. In its office it may be assimilated to the vas deferens of the male.

The round ligaments are two small circular cords, which, arising from the angle of the uterus at its sides, anterior to, and rather below the Fallopian tubes, run between the duplicatures of the peritoneum, constituting the broad ligaments, until they arrive at the sides of the pelvis. They then leave the broad ligaments, and, turning forwards, take their course round just below the brim, eventually pass out at the ring of the external oblique muscle, and are lost in the groin and parts adjacent. They consist of a congeries of blood-vessels, nerves, and absorbents; and by them a communication is kept up between the uterus within the pelvis and the structures on the outside. It is in consequence of this direct communication, that, in some of the malignant diseases of the uterus, the glands in the groin take upon themselves unhealthy action, and become enlarged, indurated, and occasionally ulcerated.

The round ligaments are figured in Plate XI. fig. 33 (*f f*,) also one in

Plate XIII. fig. 45 (*p*,) and particularly well shown in Plate XIII. fig. 46 (*i i*,) where their origin, course, and escape through the ring may be clearly traced.

Plate XI. fig. 33, shows the back face of the vagina, the uterus, and its appendages. On the left side, the peritoneum is dissected off the body of the uterus, to display the round ligament more fully. The fimbriated extremity of the left Fallopian tube is spread upon and embracing the ovary of that side, as happens during conception. (*a*) the fundus uteri, (*b*) its body, (*c*) the neck, (*d*) the mouth, (*e e*) the broad ligaments, (*f f*) the round ligaments, (*g g*) the Fallopian tubes, (*h*) the fimbriated extremity of the right side, (*i i*) the ovaries, (*k*) the vagina split up, to show the rugæ on its posterior surface.

Plate XIII. fig. 45, represents the left section of the female pelvis, drawn from a very accurate German model in my collection. (*a*) the fourth lumbar vertebra, (*b*) the rectum, (*c*) the left iliac fossa, (*d*) the rectus abdominus muscle, springing from (*e*) the symphysis pubis, (*f*) the mons veneris, (*g*) the clitoris, (*h*) the left nympha, (*i*) the left labium externum, (*k*) the fundus uteri, (*l l*) the ovaries brought upwards, (*m*) the posterior surface of the right broad ligament, (*n*) the right Fallopian tube turned downwards, (*o o*) the fimbriated extremities of the tubes, (*p*) the right round ligament—the dotted line crosses the fundus of the bladder, (*q*) the os uteri, (*r*) the vagina, (*s*) the point of the coxyx, (*t*) the sphincter ani, (*v*) the sphincter of the bladder, (*w*) the urethra—the dotted line crosses the perineum, (*x*) the meatus urinarius.

Plate XIII. fig. 46, gives a good view of the flooring of the pelvis looking into it from the abdomen; it is taken from a cast also in my collection, modelled by the late Mr. Joshua Brookes. (*a*) the mons veneris, (*b*) the bladder, (*c*) the fundus uteri, (*d*) the rectum, (*e e*) the Fallopian tubes, (*f f*) their fimbriated extremities, (*g g*) the ovaries brought upwards into view, (*h h*) the posterior processes of the broad ligaments, (*i i*) the round ligaments running forwards to escape out of the pelvis at the ring, (*k*) the cœcum with its appendix vermiformis, (*l*) the small intestines, (*m*) the body of one of the lumbar vertebræ.

Plate XIV. fig. 47, delineates the arteries of the uterus; it is copied from one of Tiedemann's beautiful engravings. The patient from whom the drawing was taken died six days after mature delivery. (*a a*) the kidneys, (*b b*) the ureters, (*c*) the uterus, about the comparative size it is usually found six days after labour; it is turned forwards over the pubes, so that its posterior face is brought into view; (*d d*) the broad ligaments, (*e e*) the ovaries, (*f f*) the Fallopian tubes, (*g*) the rectum cut, (*h*) the aorta, (*i*) the superior mesenteric artery divided, (*k*) the inferior do., (*l l*) the renal, (*m m*) the common iliacs, (*n n*) the external do., (*o o*) the

Fig. 45.

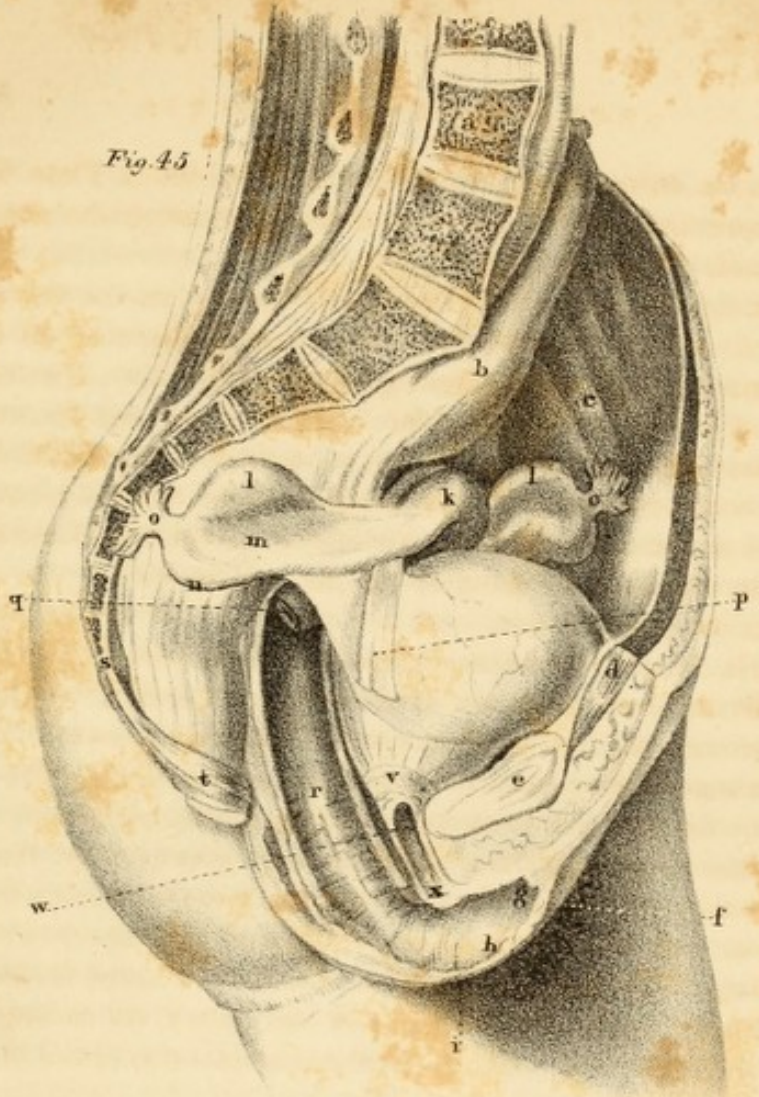
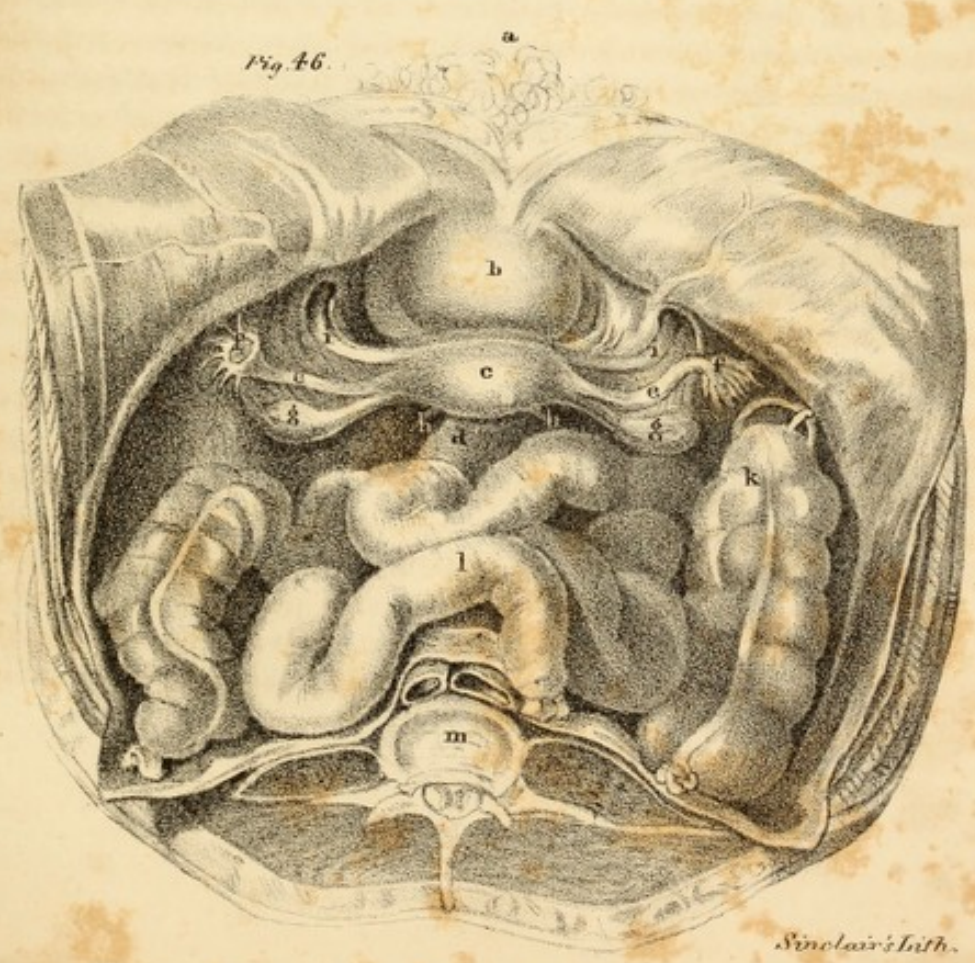


Fig. 46.



Sinclair's Lith.

internal do., (*p p*) the uterine arising from the internal iliacs, (*q q*) the gluteal, (*r r*) the obturators, (*s s*) the internal pudic, (*t t*) the ischiatic, (*u u*) the lateral sacral, (*w w*) the circumflexa ilii, (*x*) the sacra media, (*y y*) the spermatics, arising from the aorta just below the renal; in this instance, as is most common, by two distinct branches.

The nerves particularly requiring our attention run in five divisions. 1st. There is a large cutaneous branch, which rises from the second and third lumbar nerves, traverses the iliac and psoas muscles, and following the spine of the ilium is expended on the integuments of the outer part of the thigh. This nerve is too high to suffer under labour, but it is liable to pressure during the last few weeks of pregnancy; the consequence of which is numbness in the track of its distribution. 2nd. The anterior crural nerve,—one of great magnitude,—takes its origin from the second, third, and fourth lumbar nerves, passes over the pelvic brim outside the femoral artery, to be distributed principally on the rectus femoris, and other flexors of the thigh. It is also out of the way of pressure under labour, but like the cutaneous branches, may suffer towards the close of gestation, to such an extent as to produce cramp on the inner and fore parts of the thigh. 3rd. The obturator, which rises from the third and fourth lumbar nerves, run round below the brim of the pelvis and passes out at the upper part of the obturator foramen. This is chiefly distributed to the abductor muscles of the thigh, and pressure on it sometimes occasions cramps on the inside of the thigh, at the commencement of labour, while the child's head is entering the brim. 4th. The great sciatic, the largest nerve in the body, is formed of the fourth and fifth lumbar, and the first, second, and third sacral nerves. It lies over the sacro-iliac symphysis, and passes out of the pelvis by the side of the pyriform muscle, through the large sacro-sciatic foramen, to be distributed to the posterior part of the thigh, and to supply the leg and foot. This nerve, situated at the back part of the pelvic cavity, and passing directly through it, is particularly exposed to pressure during child-birth; and it is not surprising that much inconvenience should result. Violent cramps in the extensor muscles of the thigh, and especially in the calf and plantar sole, are almost universally attendant on lingering labours, and often, also, on those of ordinary duration, during the time when the head is fully occupying the pelvic cavity. Such muscular spasms add much to the agony endured; they may sometimes be mitigated by pressure and hard friction over the part in pain. 5th. The fourth sacral is entirely expended on the parts within the pelvis and about the anus. The fifth is sometimes wanting, and is always very small. The pudic nerve which supplies the clitoris and other external organs is derived principally from the third sacral.

Thus, when first the uterus subsides, preparatory to its taking on expulsive action, the cutaneous and crural nerves suffer, causing numbness and pain in the fore and outer part of the thigh; when the head is passing through the brim the obturator may be pressed on, producing cramps on the inside of the thigh: when labour is well advanced, the sciatic can scarcely escape pressure; and more or less of cramp at the back part of the thigh, the calf of the leg, and sole of the foot, is the consequence. Occasionally, indeed, lameness and partial paralysis continue for some time after. The varicose state of the veins, and anasarcous swellings of the lower extremities, so common during pregnancy, also originate from pressure, and mostly disappear, or are much relieved, in a few days after the termination of the labour.

Plate XIV. fig. 48, from Moreau's work, faithfully describes the course and distribution of the principal pelvic nerves; it is drawn from the body of a woman who died four days after labour. The left side of the pelvis is cut away, the division being made at the sacro-iliac symphysis, posteriorly, and at the ramus of the pubes in front, just at its outer extremity, before it divides into the two branches, horizontal and descending. The bladder collapsed is seen behind the pubes, the vagina and rectum are also well displayed, as is the uterus, large, from having so recently expelled a fœtus. The left ovary is drawn up, and the fallopian tubes foreshortened, to give a view of the spermatic vein (*a*,) and the spermatic artery (*b*;) (*c*) directs to the vena cava, (*d*) the aorta; (*e e*) cut portions of the inferior mesenteric nerves, branches of the great sympathetic; (*f g*) the fourth and fifth lumbar ganglia; (*h i k*) the first, second, and third sacral; (*m m m*) the sacral nerves cut which are to form the great sciatic; (*n*) a branch supplying the lower part of the rectum, which rises from the fourth sacral. Immediately below the bifurcation of the aorta, lying over the sacral promontory, a large plexus of nervous filaments is seen, which is called the superior hypogastric, or common uterine plexus; this is formed by the continuation of the inferior mesenteric nerve, and by branches from the lumbar ganglia; it chiefly supplies the uterus. On the side of the vagina, rather above its centre, there is visible another extensive plexus of nervous threads, spread out into a large number of irregular meshes; this is also formed from branches sent off from the inferior mesenteric, and others from the lumbar and sacral ganglia, and from the sacral nerves, and supplies the upper part of the vagina and the lower portion of the uterus; this is the inferior hypogastric plexus. Branches arise from the lower sacral nerves (*m m*,) to be distributed on the bladder, and lower part of the vagina, the vesical and vaginal nerves. Behind these nerves, and the inferior hypogastric plexus, the uterine artery may be observed running up the vagina, and giving off transverse branches

to that organ. The pudic nerves are not shown here. It is evident that, since they emerge from the pelvis, and re-enter it, the pudic nerve on the side opened must be destroyed, when the pelvis is divided as this plate represents.

The muscles within the pelvis deserve notice; for, by being pressed on during the escape of the child's head, they are sometimes strained, and pain is experienced in moving the thigh, and in evacuating the rectum, for some days subsequent to labour. *The levator ani*, one on each side, of the shape of a fan, rises from the pubes just below the brim, the aponeurosis covering the obturator internus, and the spinous process of the ischium, passes down by the side of the vagina, and is inserted into the sphincter ani, as seen in Plate XIV. fig. 48. On dissecting away these fibres, we observe the *obturator internus;* which, taking its origin from the inner surface of the obturator ligament, and a portion of both the pubes and ischium in the neighbourhood of the foramen, sends off a tendon that, running round the ischium like a pulley, passes out of the pelvis through the small sacro-sciatic foramen, and is inserted into the fossa trochanterica at the root of the trochanter major. *The pyriformis* rises from the anterior surface of the second, third, and fourth divisions of the sacrum, escapes from the pelvis through the large sacro-sciatic foramen, and is also inserted into the fossa trochanterica, near the insertion of the obturator. *The coxygeus* springs from the spinous process of the ischium, and is attached to the side of the coxyx through nearly its whole extent. *The transversus perinei* rises from the side of the tuber ischii, and is lost upon the sphincter ani, sphincter vaginæ, and the structure of the perineum itself.

Analogy between the genital organs in the two sexes.—Although the organs of generation appear to be widely different in the two sexes, and indeed give them their distinctive characters; yet there is seen, on closely comparing them, a great similarity, not only in function, but even in formation; so that we cannot withhold our belief that they have both been fashioned on a common model. The resemblance between the ovaria and testes in office, form, organic elements, and original situation is most striking. For the testes lie in the abdomen until about seven months of fœtal life are passed, and they are both supplied by blood-vessels arising from the same source, and following the same track. The uterus has been likened to the prostate; and it certainly bears a great similitude, in its position at least, during fœtal life. The vasa deferentia and fallopian tubes resemble each other in function, and construction. The clitoris may be likened to the penis, and the labia to the scrotum. In many instances the confusion arising from this similitude is so remarkable that it is difficult to decide, particularly in infancy, to which sex the individual belongs.

It must be observed, indeed, that the earlier the time chosen for making the comparison, the stronger will the resemblance be. The clitoris of a fœtus of three months is as large as the penis of a male at the same age, and in a more recent period of intra-uterine existence the distinction of the sex is by no means perceptible.

Fig. 47.

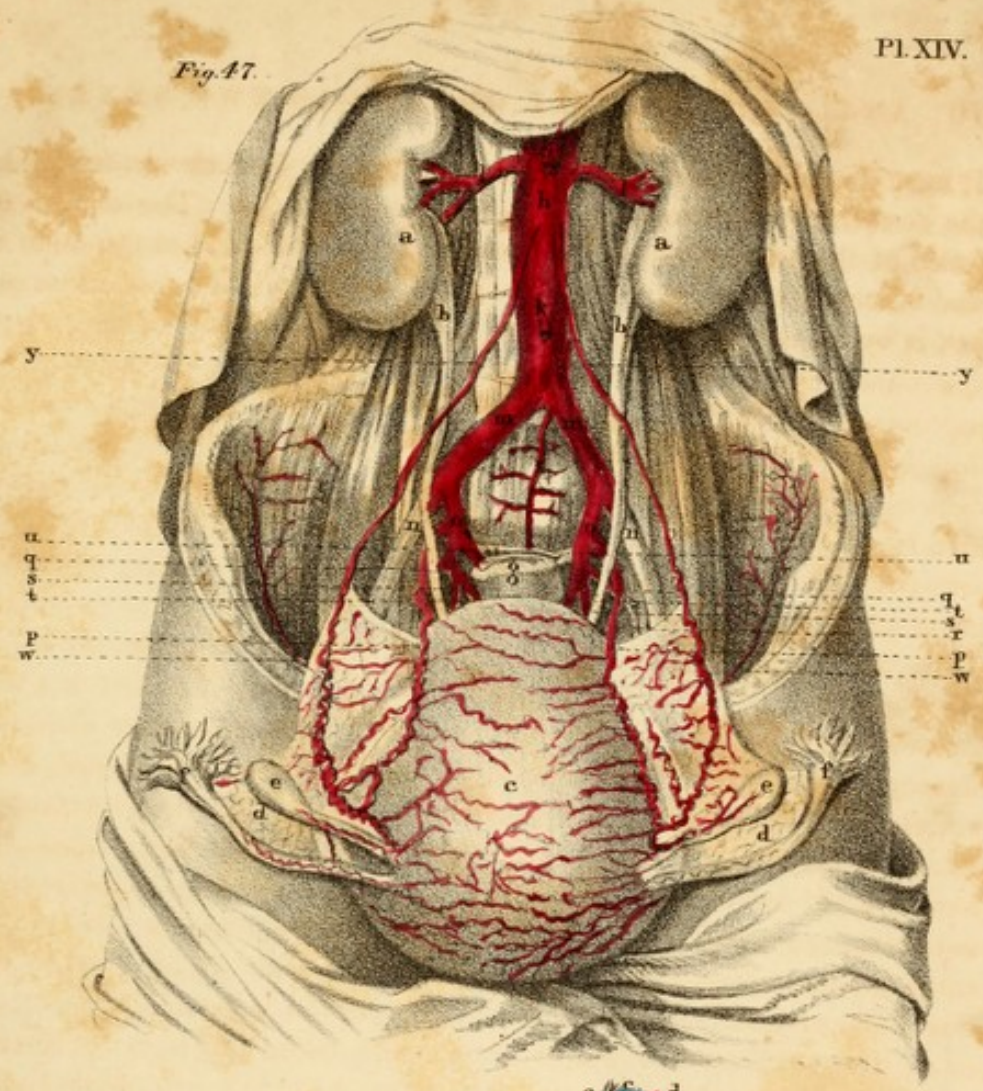
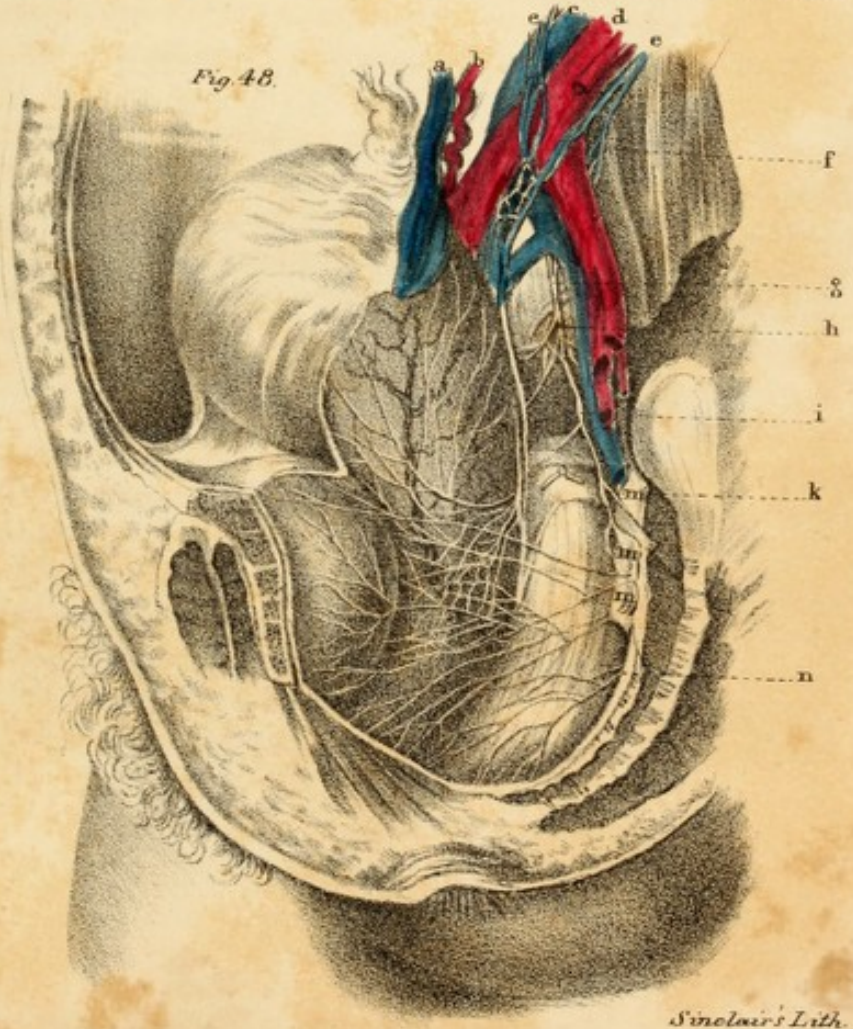


Fig. 48.



Sinclair's Lith.

OF THE GRAVID UTERUS.

Plates XV., XVI., XVII., XVIII., XIX., XX., XXI.

Contrast between the unimpregnated and gravid Uterus.—When we compare the unimpregnated with the gravid uterus at the end of gestation, we should be inclined to doubt,—from the extraordinary alteration that has taken place during pregnancy—whether in reality they were not two perfectly distinct organs. We observe an amazing difference, indeed, in every essential attribute, particularly in *form, size, situation, texture, power,* and *contents.*

The Form has undergone great change: previously to impregnation it is somewhat triangular, or like a slightly compressed pear; at the end of gestation it is of an egg shape.

The alteration in size is most remarkable; the virgin uterus measures not more than three inches in length, and two in breadth; when labour is near at hand, it is about thirteen inches long, and eight or nine across.

The unimpregnated uterus has been described as situated within the pelvis, between the bladder and the rectum, sustained in its position by ligaments passing from it to the pelvic and lumbar bones. On the contrary, the gravid uterus has become an abdominal viscus; it fills a large portion of that cavity, stretches the muscles considerably, and is supported by the parietes in front and at the sides, and by the pelvic bones below.

The texture of the unimpregnated uterus is close, tough, firm, and inelastic; the structure of the organ when gravid is loose, spongy, and distensible, capable of being drawn out to a considerable extent between the fingers without laceration of its substance. The looseness of its texture depends chiefly on the enormously increased size which its vessels have acquired during the development of the organ.

It is subservient both to the nutrition of the embryo, and to the preservation of its vitality; and thus, before the elaboration of the placenta, it seems to perform for the new being, functions analogous to those which, in an after stage, are carried on by the placenta itself.

When the ovum is first seen, it is completely surrounded by minute filamentous, mossy vessels, as with an efflorescence, which proceed from the chorion and embed themselves in the semi-fluid deciduous secretion; these have been called the *shaggy chorion*.* As it continues to grow, the chorion and amnion increase in extent, but the flocculent vessels do not increase in the same proportion. They now no longer surround it at all points, but are left, as it were, in one corner, and gradually become clustered together, to form the fleshy placenta; while the greater part of the ovum becomes as gradually enveloped by the thin pellucid membranes.

Plate XV. fig. 52, shows the filamentous vessels entirely surrounding the chorion. Fig. 53 (*a*,) the same vessels thicker and more numerous at this point than at any other: they are being collected, by degrees, into one mass, for the formation of the placenta; (*b*,) the chorion denuded of the shaggy vessels. Fig. 54 (*a*,) the pellucid membranes which have increased in extent, leaving the shaggy vessels collected into one mass, to form (*b*,) the placenta; (*c*,) the embryo seen through the membranes. This ovum is about eight weeks old, and is the most perfect specimen of so early a placenta I have yet seen. The drawing represents the appearance of the ovum when it was expelled, distended with the amnial fluid.

Plate XVI. fig. 56, from Hunter's splendid work on the gravid uterus, displays an ovum of five months of age within the womb, which has been laid open; the vessels ramifying on the decidua ovuli are well delineated; and the gelatine secreted by the gladulæ Nabothi at the cervix uteri (*a*,) is also tolerably distinctly pictured. One coil of the funis is seen twisted round the neck, and another round the left ankle.

As gestation advances, the deciduous membrane becomes thinner and less tenacious; and at the full period of pregnancy, it is very difficult to separate the two layers one from the other.

* Velpeau, Carus, Breschet, and other physiologists, think that these villi are not blood-vessels, because they cannot detect canals in them, even by powerful glasses; and Dr. Montgomery, in a paper in the 4th volume of Dublin Medical and Surgical Journal, says, "They seem to be merely spongioles and to act as suckers, by which the ovum is supported until its connexion with the uterus is more perfectly accomplished by the development of the vessels of the placenta." I look upon them as blood-vessels. They are very similar to the vascular tassels attached to the fœtal membranes which dip into the cups of the cotyledons in the gravid uterus of the cow and sheep, and which in those animals are most easily injected from the umbilical vessels. They are evidently for the purpose of nourishing the young ovum. Baillie (continuation of Hunter's description of the gravid uterus) says, probably some of them are lymphatics, though that has not been demonstrated.

Fig. 50.



Fig. 49.



Fig. 51.

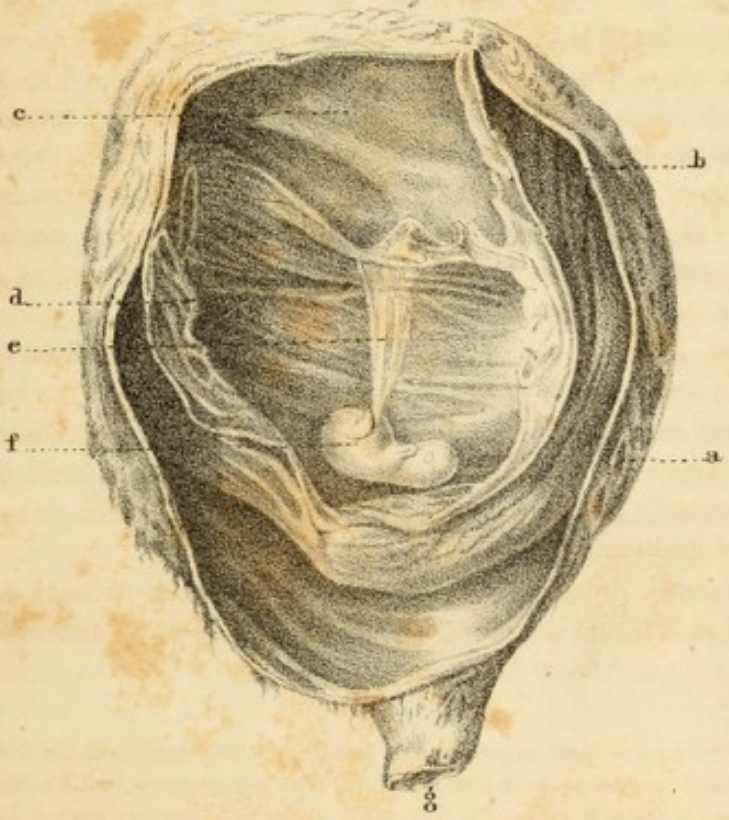


Fig. 52.



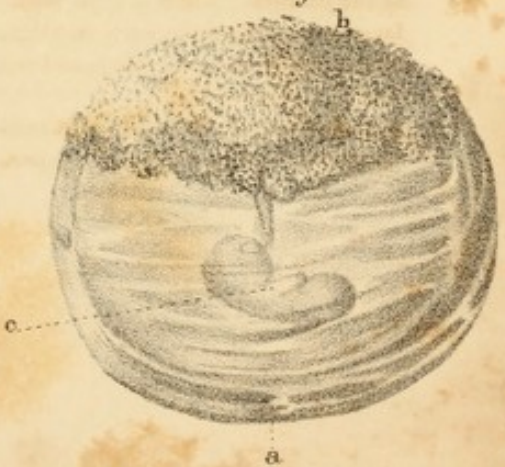
Fig. 53.



Fig. 55.



Fig. 54.



Sinclair's Lith.

Chorion.—Having divided the decidua in our dissection, we arrive at the external membrane of the ovum, the chorion; a thin, glistening, transparent membrane, much resembling the delicate serous tissues, very tough for its tenuity, enveloping and affording an external covering to the whole of the ovum, with the exception of the placenta, which is interposed between it and the uterus. It passes on the fœtal face of the placenta, and gives a coat to that surface as well as to the funis umbilicalis.

It is a constituent part of the ovum from the remotest period of conception, because in extra-uterine pregnancy we find it, not in the uterus, as the deciduous membrane is, but enclosing the embryo itself. It possesses no blood-vessels evident to the naked eye; but we cannot deny its vascularity, since it is subject to disease, and in many of the mammalia may be readily injected. It is for the purpose of protecting the embryo in conjunction with the amnion, and of assisting to form both a bag for containing the liquor amnii, and also a soft wedge by which the structures during labour, may be dilated with the least possible chance of injury.

Amnion.—The chorion having been cut through, we next meet with the amnion, another very thin, transparent, and tough membrane, in structure and appearance so similar to the chorion, that it is almost impossible to distinguish the one from the other. It is destitute of coloured vessels, but it, too, must possess vascularity; because, like its twin sister, it becomes thickened by disease, and because it enjoys in an eminent degree the power of secretion. It runs in contact with the chorion throughout its whole extent, except just at the placental extremity of the funis umbilicalis, where these membranes are separated; and to this formation the term processus infundibuliformis has been applied. It is connected with the chorion by means of an intermediate, transparent, gelatinous substance, of which there is sometimes a tolerably thick stratum. It gives an external coat to the fœtal face of the placenta, and to the funis umbilicalis. On dividing the navel string, we find the chorion between the amnion and the proper substance of the funis itself. The placenta and funis, then, may be said to be behind the amnion and chorion, in the same way as the bowels are said to be behind the peritoneum. Its use is exactly analogous to that of the chorion, so far as affording a covering to the ovum is concerned; but it performs an additional distinct function in the secretion of the liquor amnii.

It is worthy of remark, that these conjoint membranes do not always possess the same degree of toughness; for we sometimes observe them in labour so exceedingly tender, that they break on the very first accession of pain; while at others, their firmness is so considerable that they remain entire much longer than they ought, and thus proportionably retard the delivery. In some few instances, they have not been ruptured at all before the child's

birth; but the ovum has been expelled whole, even when it has arrived within a few weeks of its maturity. Nor do they increase in density and strength in a relative proportion as the process of gestation advances: for even at the earliest age, they resist the application of moderate pressure; and at five or six months, they are often found as strong as they usually are at the expiration of the whole period: of the two membranes, the amnion is by far the strongest.

In the first few weeks of gestation, the chorion and amnion are not in contact except at one point, there being a quantity of transparent watery fluid, resembling the liquor amnii, placed between them. This is gradually absorbed during the progress of pregnancy, until it entirely disappears. Sometimes, though rarely, there still remains some fluid between the membranes at the close of pregnancy, and this is what in labour is called the false waters. In Plate XVI. fig. 58, is delineated an ovum of about five weeks' age, in which the outer sac (*a*,) the chorion, has been opened to display (*b*,) the amnion enclosing the embryo, and (*c*,) the vesicula umbilicalis. In this specimen, the chorion is of far greater extent than the amnion, and there existed a proportionate quantity of water between them. These two membranes are also beautifully shown in Plate XVI. fig. 57, representing an ovum of five months age. The fœtus is enclosed within the amnion, which is unopened, and is separated both from the chorion and placenta, but still adherent to the placental extremity of the funis: (*a*) a portion of deciduous membrane, (*b*, *b*) the placenta, (*c*) the chorion, (*d*) the amnion with the fœtus within it.

Liquor Amnii.—The chorion and amnion, as well as the two layers of the decidua, being opened, we penetrate into the centre of the ovum, and the liquor amnii escapes. This is the name given to the waters surrounding the fœtus, in which it floats. The liquor amnii varies exceedingly at the end of gestation, both in its quantity and properties:—in quantity, from a few ounces to a gallon or more; in properties, from being perfectly pellucid and inodorous, to a thick, somewhat viscid, dirty fluid, nearly as dark as a strong infusion of coffee, and occasionally of a putrid odour. The usual appearance of the liquor amnii is that of rather dingy water, of a greenish or yellowish cast. It contains some salts, especially the muriate of soda, and phosphate of lime, and a free acid known as *amnic acid*, by some supposed to be benzoic acid. Urea has also been discovered in it; and sometimes a very small quantity of albumen is held in solution, as is evidenced by its becoming turbid on the application of heat.

The relative proportions between the quantity of the fluid and the size of the embryo differs much at different stages of pregnancy, being considerably greater in the earlier periods, and less at the advanced stage. Thus, when the embryo is scarcely visible to the naked eye, there is from

Fig. 56.



Fig. 59.



5 months

Fig. 58.



Fig. 57.

5 months



Sinclair's Lith.

half a drachm to a drachm of water collected within the membranes. In Plate XV. fig. 51, where the embryo is not so large as a small kidney-bean, there would be an ounce or more of liquor amnii; while at the end of gestation, when the fœtus weighs on an average nearly seven pounds, the amount of fluid seldom exceeds a quart. The quantity, therefore, though *positively* increasing with the growth of the ovum throughout the whole of gestation, is *relatively to the size of the fœtus* gradually diminishing.

The origin of this water has given rise to much controversy: it has been regarded as an excretion from the fœtal body,—either urine or perspiration. This, however, cannot be, because, as just observed, a quantity of fluid is present before the embryo is visible; and the relative proportion to the size of the fœtus at the different ages of pregnancy would also discountenance such an idea. It has been supposed to be a specific uterine secretion; but in extra-uterine conception it is found surrounding the fœtus, and not within the uterine cavity. It is now generally regarded as a secretion or exudation from the inner surface of the amnion, supplied by innumerable colourless vessels, which ramify on that membrane.

Use.—Nor has its intention or use been a less fruitful ground of dispute. At one time it was supposed to have been formed for the purpose of nourishing the fœtus; but this notion is very unphilosophical;—because we can assign other most valuable uses to it;—because we have no need of its agency in this respect, since there is a regular system of vessels connected with the fœtus, through which the means of increase can be supplied;—because it is sometimes perfectly unfitted for nutriment, being turbid, and occasionally putrid;—because it is proved by analysis to contain no nutritious properties, or if any, a very inconsiderable proportion;—and because of the large relative quantity in the first few weeks of gestation. Besides, monstrosities have been brought forth without either œsophagus or digestive apparatus. Such a production could not have obtained nourishment by means of internal organs. These facts have led others to believe that it nourished the fœtus by absorption through the skin. This supposition is equally improbable, for many of the reasons just stated; and to them may be added, that as the liqour amnii is secreted by the amnion, which is continuous with, and, as it were, an extension of, the fœtal skin, we cannot concede to it the office of affording a nutritious matter to be afterwards absorbed by the cuticular vessels.

Its real use appears to be, to defend the young embryo, in the early weeks of pregnancy, from the pressure of the uterine parietes, which must otherwise have annihilated it; and this is the reason why it then exists in such large proportionate quantity;—to protect the vessels of the funis and placenta in the latter months from a degree of compression

which would have impeded the regular flow of blood through them;—and to allow free motion to the limbs of the fœtus, so as to prevent them being cramped or distorted. It has also been supposed (since water is so bad a conductor of heat) to keep up an equable warmth in the fœtal body throughout the whole of gestation, to whatever varying circumstances of temperature the woman's person may be exposed. Besides these advantages, we find it performing a most important service in labour, when it conduces so essentially to the formation of the soft wedge-like bag. Its value does not cease even on the rupture of the membranes; for it assists in lubricating the vagina and external parts, and by this means prepares them for the more easy passage of the child.

Placenta.—Of the fœtal appendages—all of them highly essential towards the well being of the ovum, either at the early or more advanced period of intra-uterine life—the placenta is perhaps the most important;—the medium of communication between the mother and her infant;—the organ through whose means life is sustained, nourishment supplied, and growth perfected.

The term placenta was derived from its shape.* It consists of a flat, spongy, irregularly circular mass, composed entirely of fœtal vessels,—the ramifications of the umbilical arteries and vein, which are connected together by loose cellular substance. It is usually from seven to nine inches in diameter, and about one inch in thickness at the thickest part, where the umbilical vessels enter its substance, gradually becoming thinner towards its edge. It generally weighs about a pound or a little more; but in this respect it varies considerably, its bulk being principally influenced by the size of the child; sometimes, however, its increased weight is dependent on an excess of its own growth alone, probably the effect of diseased action. It has been supposed to possess absorbents. Hunter† suggested the probability of these vessels being present; Schræger, Wrisberg, and Chaussier, contend for them; and Fohmann imagined he had found them in rich profusion. Sir E. Home and Mr. Bauer believed they had detected nerves by the aid of a strong magnifying power; and this is also the opinion of Chaussier. I have never been able to see either nerves or absorbents in this organ, or in the funis; and most physiologists deny their existence. If it possessed absorbents, it is to be presumed that they would be sufficiently evident to the eye in every instance; and a strong argument against there being nerves is the fact, that no pain is felt by the child when the funis is divided.

* *Placenta* in the Latin language signifies a cake; from πλακους, the same.

† M. S. Lectures; vide Granville on abortion, p. 19.

Fig. 60.

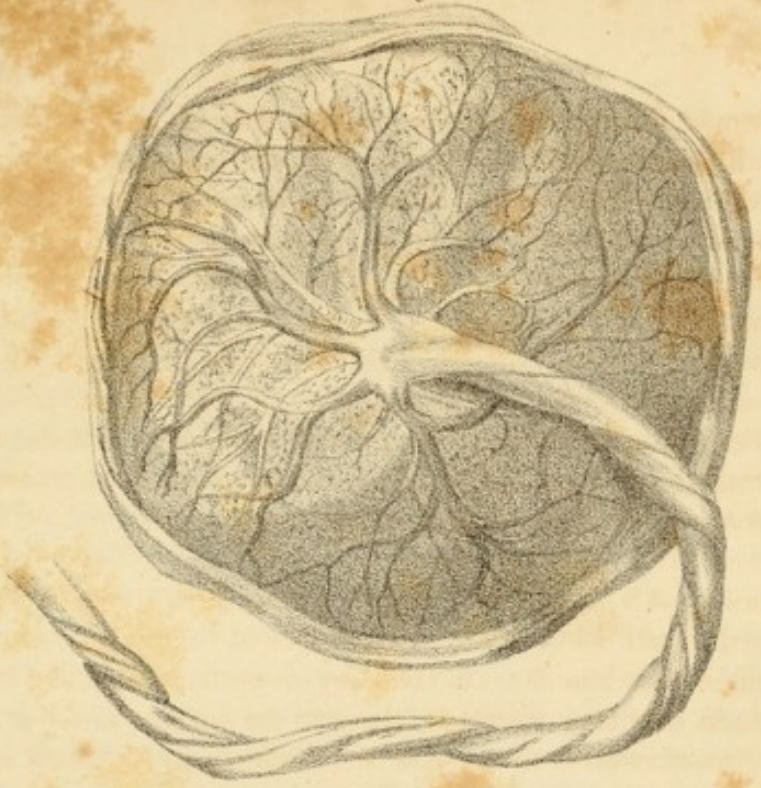


Fig. 62.



Fig. 61.



Sinclair's Lith.

It has two faces:—the one fœtal, Plate XVII. fig. 60, next the embryo; the other maternal, fig. 61, in apposition to the uterus. It is covered on the fœtal face by the reflexed decidua, by the chorion and the amnion; and on the maternal by the decidua vera. The fœtal surface has, therefore, a smooth, glistening appearance, which it obtains from the two ovular membranes; these are raised into numerous dark coloured ridges, radiating in a serpentine manner from near the centre, and becoming less evident as they approach the edge; produced by the divisions of the umbilical vessels, before they dip into, and bury themselves in, the substance of the mass. As these tortuous eminences are vessels, and the largest of them veins, the deepness of their colour depends on the contained blood shining through their coats, and the transparent membranes covering them. The maternal surface presents a very different appearance. Invested with the opaque, flocculent, fibrous decidua, it puts on a fleshy look, and is divided by sulci into a number of irregularly shaped lobes. Each of these lobes is formed by the ramifications of one branch of the umbilical arteries and vein on their first splitting; and the vessels of one lobe, subdividing in an arborescent form, anastomose but sparingly with each other, and not at all with those of its neighbour. The deciduous membrane is carried continuously over from one lobe to the others, like the arachnoid over the convolutions of the brain, and does not penetrate between them into the placental structure. By some anatomists nevertheless, it is supposed to dip deep among the placental vessels, even to the fœtal face of the organ.

Use.—It is now established as an incontrovertible fact, that the salubrious change which the fœtal blood undergoes, is accomplished in the placental mass; but the immediate mode has given rise to much difference of opinion. It has been explained in four ways. Some physiologists contend that there is a direct communication between the mother and the fœtus by means of *continuous vessels*. Others, that the mother's blood passes by *absorption* into the fœtal system. Others, again, that the mother's blood is poured into certain *sinuosities* or *cells*, existing on the maternal surface of the placenta, which are destined by nature to receive it; and that while extravasated in these cells, the fœtal vessels deprive it of whatever is necessary for the preservation of the embryo. This was the theory established by Hunter, which became so widely disseminated and followed. This physiologist, therefore, considered the placenta divisible into two distinct portions,—a fœtal and maternal; and he described also two separate circulations going on in it simultaneously,—the one of the mother, the other of the child:—while another party entirely denies the existence of the placenta cells; and supposes that the same benefits result to the fœtus—its vessels ramifying in close approximation

to those of the mother—although the mother's blood *never enters the placenta* at all, nor ever indeed leaves her system.

I am myself an advocate for the last view. Since the question, however, is yet in dispute, and since its discussion would occupy much space, it would be out of place to enter upon the different arguments in a work principally directed to practical objects. But rendering the blood fitted for the continuance of life is not the sole office of the placenta; it is the means also of conveying nourishment to the fœtus; so that this viscus performs at the same time the functions of two of the most important organs of breathing life,—the lungs and stomach.

Attachment.—The placenta may be attached to any part of the internal surface of the uterus, and it necessarily occupies a space equal to its own diameter. It is perhaps most usually apposed against the posterior surface of the body; but occasionally it is found at the very fundus, more rarely towards the neck, and more seldom still over the mouth itself; in which latter case its position must necessarily give rise to much loss of blood when the orifice opens in labour.

Its attachment is by *simple apposition*, one layer of the decidua being interposed between the two surfaces. There is no *adhesion* in the natural condition of the parts; and whenever agglutination does take place, it is the consequence of diseased action.

Disease.—The placenta is liable to organic change of structure. Thus it is sometimes found so soft, as scarcely to bear the gentlest handling without being broken. At other times it is much firmer than common, although no other morbid alteration can be observed in it. At others, granules or spiculæ of bone are strewn over more or less of the maternal face, or pervade more or less the whole substance; so that when the finger is run over it, it feels as though it had been dusted with coarse sand. In other instances, again, solid tumours, bearing much the appearance of scirrhous glands, are found embedded in the mass; and occasionally, but very rarely, it is hydatidinous.

Twin placentæ.—In plural gestation a separate placenta, a separate funis, a distinct set of fœtal membranes, and a distinct quantity of liquor amnii, are formed for each child. The placentæ are commonly joined together at their edge, and when regarded on the maternal face, they have the appearance of a single organ. But the vessels of the one do not anastomose with those of the other;—the circulations are perfectly independent; so that the blood of one child does not pass into the system of its brother. One of the twins may, therefore, still live after the other has died;—one may be healthy while the other is the subject of disease, Plate XVIII. fig. 63.

It occasionally happens, indeed, that a communication exists between

the vascular systems of the two children, though they are both enveloped in separate membranes; and it has been also, though very seldom, remarked, that both were wrapped up in the same bag of membranes; and that the funis having arisen by one branch from the single placenta, has split into two divisions to supply each fœtus.

Battledore placenta.—The navel string usually enters the placenta near the middle; but it sometimes passes into it at the edge; and not unfrequently the vessels divide into a number of branches before they arrive at the substance of the mass. To this formation the name of the battledore placenta is given; Plate XVIII. fig. 64; and it is of importance in practice, that this deviation from the natural condition should be borne in mind; because if attempts were made to remove a placenta of this description by traction at the funis, as soon as the insertion of the vessels into its substance could be felt by the finger,—while the great part of its bulk was still in utero,—much danger might be induced; as will be shown in an after part of this publication.

The Funis Umbilicalis, umbilical cord, or navel string, is a rope-like cord running from the navel of the child into the body of the placenta—a framework for the transmission of blood-vessels. It varies much in length; in some instances not exceeding six or seven inches; in others being more than five feet. Its average length may be regarded as from eighteen to twenty-four inches. It varies also in thickness, and this depends on the larger or smaller quantity of a viscid semi-transparent gelatinous matter,—the gelatine of Wharton—contained in cells, which constitutes the principal part of the thickness of the cord. These cells do not communicate with each other freely. Both the cells and the contained gelatine are evidently for the purpose of protecting the blood-vessels from pressure. Plate XVII. fig. 62, shows a portion of the funis cut longitudinally; the dark spaces are the cavities of the arteries and veins unoccupied; the lighter parts show the reticular cells filled with mercury. The preparation from which this drawing was taken, proves how slight the connexion between the cells must be; else, as the funis is suspended from one extremity in the spirit which preserves it, the mercury would run out by its own weight.

The funis gives a passage to three blood-vessels—two umbilical arteries and one umbilical vein. The arteries are longer than the vein, being considerably more tortuous; and they generally continue their course in a spiral direction, running round the vein; in the majority of cases being twisted from the left to the right. Plates XVII. figs. 60 and 61, and XVIII. figs. 63 and 64. They sometimes form simple turns upon themselves, as seen in Plate XVII. fig. 65, (*a a;*) at others they are twisted into fantastic convolutions, giving the external surface of

the cord a knotty appearance, not unlike varices in the legs. Plate XVIII. fig. 64, (*a*.) They will then run for some length straighter and nearly parallel to the vein. Sometimes the funis itself is found in labour to be twisted into a loose knot; but this appears to me to be produced rather by the movements of the fœtus in utero, than to exist as an original conformation. The vein is much greater in its calibre than the two arteries together; but as the latter vessels are perhaps twice the length of the vein or more, the quantity of blood actually contained in the two arteries at one time may be nearly the same as in the vein.

The vein possesses no valves; and the arteries do not communicate with each other until they reach the placenta; when one generally sends off a large transverse branch to the other. The arteries carry adulterated blood from the body of the fœtus to the placenta, and have a very strong pulsation; the vein carries back again to the fœtus, pure blood imbued with the principles of both vitality and nourishment. In some respects, then, these canals may be likened to the pulmonary vessels; but the umbilical vein, by transmitting the means of growth, as well as of the continuance of vitality, performs an office superior in value to the pulmonary veins, which give passage to fluid fraught with the principles of life alone. Whether much difference of colour exists in the blood transmitted by the vein and that circulating in the arteries, is a point not very easy to determine. Granville and Mayo assert that the colour of the blood in the umbilical vein is somewhat lighter than that in the arteries. Meckel and Blundell, again, think there is no manifest difference, and that both contain an equal quantity of carbon. But while we know that breathing life cannot be sustained without some alteration being effected on the blood through the influence of the atmosphere, and that even aquatic animals are furnished with organs for the express purpose of purifying their blood, it is not too much to assume that a similar change is required for preserving the vitality of the fœtus; and that this function is carried on by the placenta.

Although there is much variation in the *straightness*, or *tortuosity*, we very rarely meet with any variety in the *number* of the umbilical vessels. In two specimens preserved in the London Hospital Museum, there is only one umbilical artery; and Dr. Hunter mentions that he had seen many instances of such deviation, but none in which there were two veins. Velpeau, however, states that two veins have been met with, and refers to Guillemot for authority. As far as regards the arteries, I do not know of any case on record, in which either of the internal iliacs sent off two umbilical branches, so as to form three arteries in the cord. Both the blood-vessels and cells are covered by the amnion and chorion;—the amnion being here, as on the fœtal face of the placenta, external.

Fig. 64.

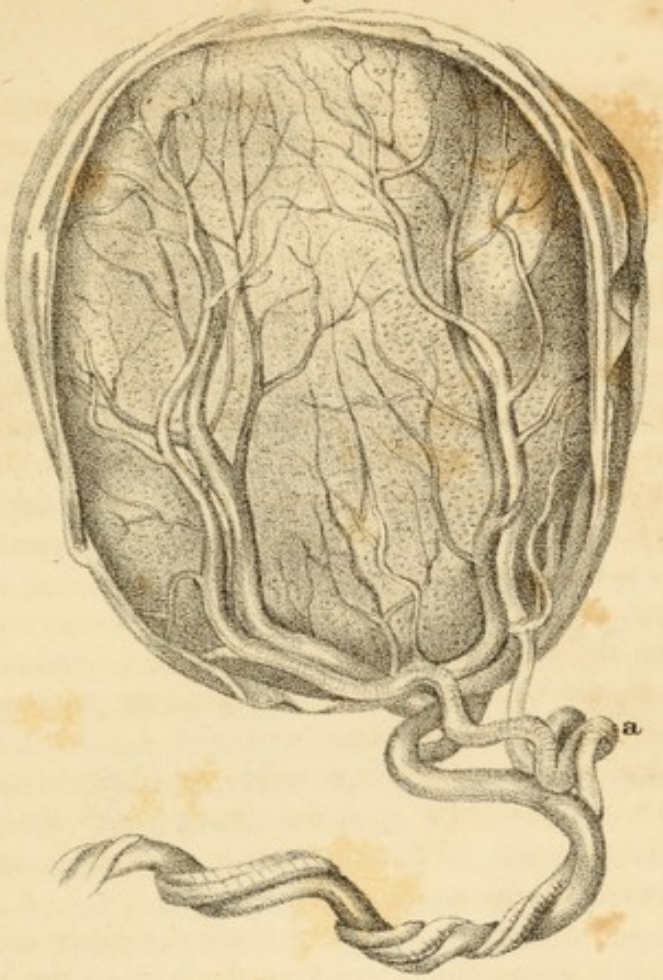
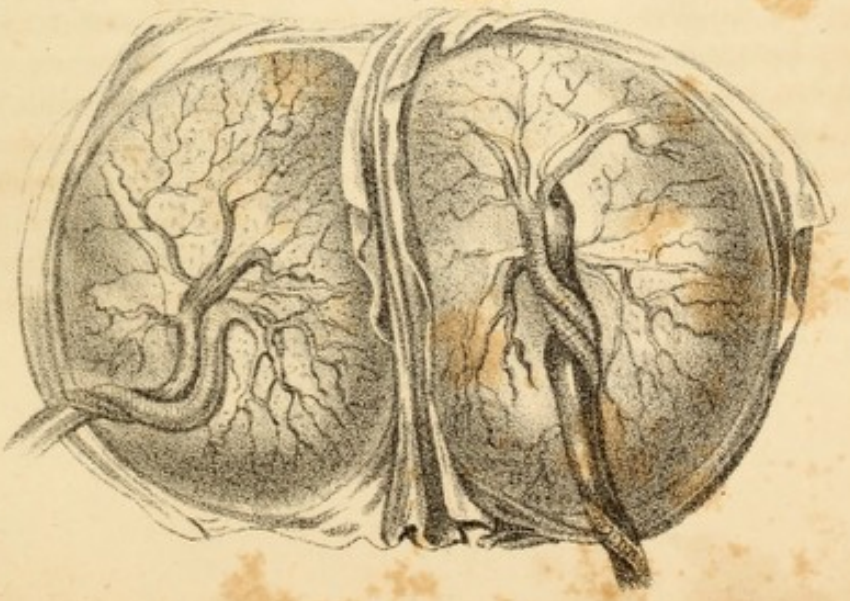


Fig. 65.



Fig. 63.



Sinclair's lith.

The rapidity of the circulation through the cord has been a subject of frequent discussion; and the probability is, that it differs much in different individuals, and in the same individual fœtus at different times. The number of pulsations generally ranges at one hundred and twenty or one hundred and thirty in the minute; but it seems that the fœtal circulation is greatly influenced not only by causes existing within its own system, but by accidental circumstances affecting the mother, and external agencies to which her person may be exposed. Both the mental passions and the loss of blood from the mother's body, with many other causes, have a decided effect on the fœtal pulse.

The funis is often found coiled round the neck or limbs of the fœtus; and this may embarrass us in practice.

When the embryo is first visible, in the earlier weeks of utero-gestation, we see nothing like a funis umbilicalis, but the newly-formed being is attached by its abdomen directly to the amnion. It appears first about the end of the fifth week: for some time it contains a much larger proportion of gelatine than during the latter months; and the vessels, which before were perfectly straight, Plate XV. fig. 51 (*e*,) assume a twisted character about the end of the tenth week.

Disease.—The umbilical cord is liable to disease; the most frequent derangement in its structure, perhaps, is the secretion of too large a quantity of gelatine in its cells. This, if considerable, may obstruct the flow of blood through the vascular ducts, and occasion the death of the fœtus. Thus, a diseased condition of the funis may indirectly lead to abortion. Plate XV. fig. 55, shows an ovum, in which the funis is much greater in circumference than it should be, owing to there having been too much gelatine formed. It destroyed the life of the embryo; but the ovum was retained in utero for some time after the cessation of its vitality, as is proved by the thickness and solidity which the involucra have acquired.

Urachus.—In the quadruped, besides the blood-vessels, there is another pervious duct running along the funis called the Urachus. This rises at the fundus of the bladder, passes out of the fœtal body at the navel, and accompanying the blood-vessels as far as the ovular membranes, continues its course till it terminates in a bag between the amnion and chorion, called the allantois; thus the cavity of the bladder communicates with the allantois by means of the urachus. In the human subject there is no duct; but an impervious cord runs up from the fundus of the bladder, and is lost at the umbilicus. This is also called the urachus; but it is not generally continued along the funis, and there is no cavity between the ovular membranes resembling the allantois.

The Vesicula Umbilicalis, or Vesicula Alba, constitutes also a part of the ovum in its early stage. It is a small sac, not larger at its greatest magnitude than a pea or swan-shot, situated between the amnion and chorion, possessing a pellucid coat, and enclosing a small quantity of viscid transparent fluid, whitish, or more generally rather of an amber colour. The largest on record is mentioned by Lobstein: this measured six lines in diameter. Its appearance is confined to a particular stage of pregnancy, being first noticed during the early part of the second month, according to most observers; but Velpeau speaks of it being the size of a pea on the fifteenth or twentieth day from impregnation, and says that it has acquired its greatest magnitude during the third or fourth week. It is generally believed, however, to enlarge till about the middle of the third month, when its contained fluid becomes thicker and opake; the vesicle itself then begins to dwindle in size, and speedily disappears altogether. Hunter, Meckel and others, have observed it at the end of gestation. When however, it persists longer than usual, it does not continue to increase, but at the close of pregnancy is as small as it was at the end of three months.

From one extremity of the vesicle a duct is sent out to join the funis umbilicalis, becoming thinner as it recedes from the bag, until to the naked eye it is lost upon the cord itself. It may be traced, nevertheless, by magnifying glasses running along the funis, entering the body of the embryo, and eventually communicating with the cavity of the cœcum or with the ilium, just where it joins the last-named intestine. The distance between the vesicle and that end of the funis farthest from the body of the embryo varies, being sometimes not more than half an inch, at others twice or three times as much.

It is supplied with blood by a distinct artery and vein, called the *omphalo-mesenteric* vessels; the artery proceeds from the inferior mesenteric, passes between the convolutions of the intestines to the umbilicus, and thence along the funis; the vein arises from the walls of the vesicle, traverses the funis in company with the artery, and finally terminates in the superior mesenteric vein, before that vessel enters the porta. The omphalo-mesenteric vessels shrivel as the vesicle itself disappears. They have been observed, indeed, both by Chaussier and Beclard, in the funis of a full-grown fœtus, dwindled into white impervious cords.

Its use is still involved in some degree of mystery. The best explanation is offered by Velpeau; he supposes the fluid it contains to be nutritious, and intended to contribute to the development of the embryo, until the cord and umbilical vessels are elaborated. It is, according to him, analogous to the vitelline sac of the chick; which it resembles in shape, position, and connexion with the intestines, structure, and the character of

the contained fluid. We must acknowledge, however, that there is a material difference between the two; because, in the chick, the ductus vitello-intestinalis is constantly becoming shorter, until the whole bag is received into the abdominal cavity; while in the human ovum the vesicula umbilicalis is in close approximation to the abdomen of the embryo until the formation of the funis; after which, its duct elongates as gestation advances; and it consequently recedes from, instead of approaching nearer to, the fœtal body.

In Plate XVI. are represented two specimens of the umbilical vesicle. Fig. 58 shows the vesicle (*c*) floating loosely, detached both from the amnion (*b*) and chorion (*a*;) it is suspended by the duct containing the omphalo-mesenteric vessels: the embryo is seen enclosed in the amnion. This ovum I should consider to be between five and six weeks old, but I am not acquainted with its history. Fig. 59 gives the vesicle (*a*) in its natural position between the ovular membranes, its fluid having already become opake. This ovum is at least seven weeks old.

THE FŒTUS.

The different constituents of the ovum, which have been already described, are formed solely for the protection, preservation, and growth of the FŒTUS:—to its necessities all the other parts are contributory and subservient. At the end of gestation the fœtus ordinarily measures about twenty inches from the crown of the head to the heel, and weighs nearly seven pounds: but there is an amazing difference in both these respects, particularly the latter; and the size is influenced by circumstances not very easily explained. Generally speaking, males weigh more than females by one or two ounces, and are longer by a third or half an inch. Some children at full time have been known to weigh even less than five pounds; while many cases are on record where the weight exceeded double the average. Thus Baudelocque mentions that he has seen one child at birth which weighed twelve pounds, and another thirteen.* The late Dr. Merriman delivered a woman of a fœtus that weighed more than fourteen pounds.† Sir Richard Croft saw one born alive of fifteen pounds.‡ Spence gives a case in which the child and placenta together weighed sixteen pounds Dutch weight, after the brain had been evacuated.§ My

* L'Art. des Accouchemens, parag. 432.

† Communicated to me by Dr. Samuel Merriman.

‡ Communicated by the same gentleman. See also Hutchinson on Infanticide, p. 15.

§ System of Midwifery, case xxv.

father once delivered a woman of a fœtus that weighed sixteen pounds and a half avoirdupois.* Dr. Moore, of New York, states that in 1821 a child was born in that city that also weighed sixteen pounds and a half.† And Mr. J. D. Owens assisted at the birth of a child, which weighed seventeen pounds twelve ounces; and whose length was twenty-four inches.‡ This, as far as I know, is the heaviest well-authenticated fœtus on record. Of the three largest children I was ever myself at the birth of, one weighed fourteen pounds; this was a breech presentation, and the child was born dead: another was twelve pounds and one ounce; this I extracted by the forceps; it was also dead: the last weighed twelve pounds and three quarters; this was expelled naturally; it gasped two or three times, but could not be restored.

The usual position in which the fœtus lies in utero is the most easy, as well as compact, that could possibly be devised for a body of such bulk and irregularity. Its general figure is that of an oval, the long diameter being placed nearly perpendicularly as regards the trunk of the mother. The head is situated towards the os uteri, the vertex being the most dependent part; the chin is pressed upon the chest; the neck and back are bent into a curve; the nates lie at the fundus uteri; the thighs are flexed up towards the belly, and the legs somewhat turned back upon the thighs; the arms are crossed upon the chest; or one hand is placed by the side of the head, and the other on the chest or by the breech; sometimes both lie by the side of the head; or they may be otherwise variously disposed. Thus one end of the oval is formed by the vertex, and the other by the breech; and its adaptation to the cavity, in which it is placed, is most perfect.

In Plate XIX., fig. 66, the fœtus at maturity is seen folded as it commonly lies in utero.

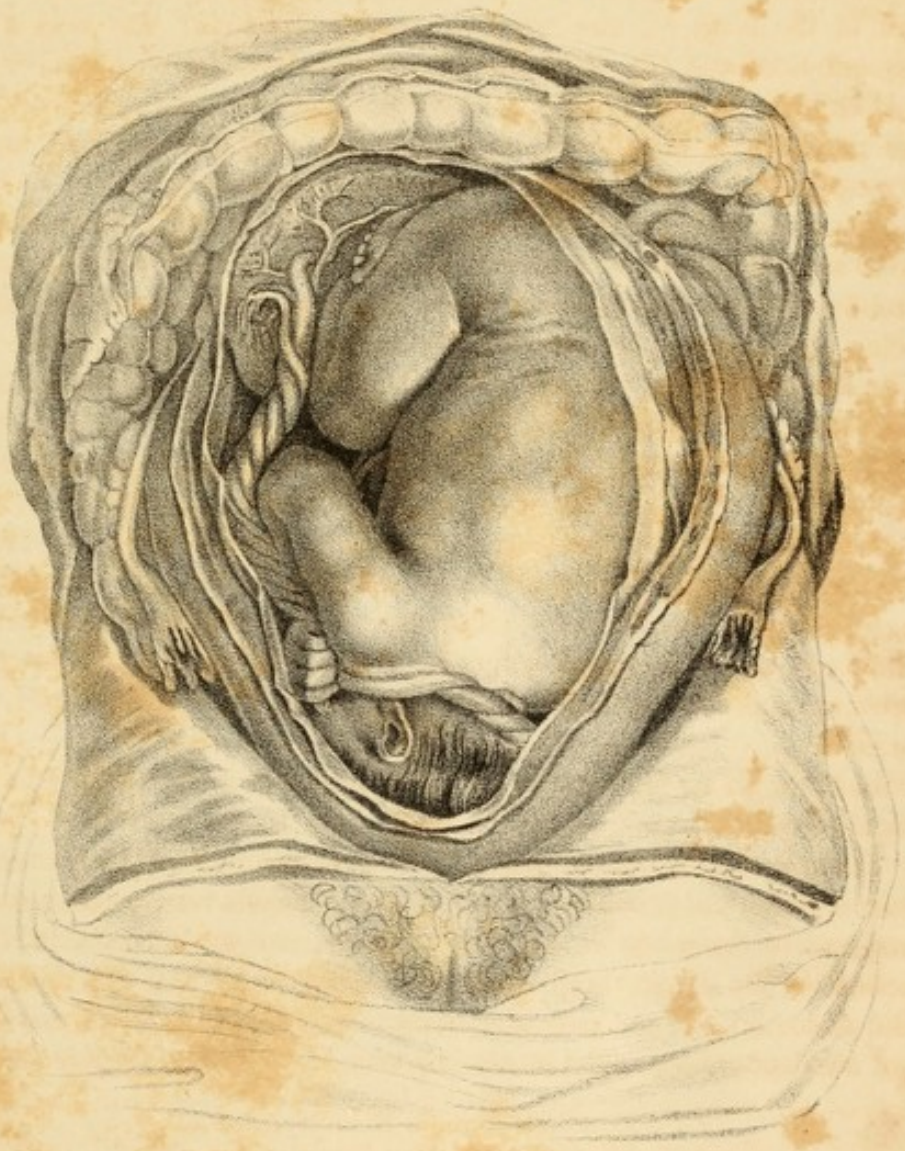
The quantity of matter that is contained within the gravid uterus at the end of gestation, provided we allow seven pounds for the fœtus, one pound and two or three ounces for the placenta and membranes, and above a pound for the liquor amnii,—will be between nine and ten pounds in all. But this will differ not only according to the size of the fœtus and placenta, but also according as the water has been more or less largely secreted.

* Practical Observations in Midwifery, case liii.

† New York Med. and Phys. Journal, vol. ii. p. 20.

‡ Lancet, vol. i. 1838-39, p. 477.

Fig. 66.



Sinclair's Lith.

DEVELOPMENT OF THE UTERUS.

The uterus is constantly enlarging during the whole term of gestation, and its increase corresponds with that of the ovum; so that its growth towards the close of pregnancy is comparatively greater from week to week than at any other period. The fundus and body are first evolved; and the neck does not begin to expand until full five months have passed. Before this time the principal part of the organ is globular in shape, and the elongated cervix projects from it below, as is seen in Plate XX. fig. 67, which is copied from Hunter's work, and represents the back face of the gravid uterus, and vagina at the commencement of the fifth month. But in the sixth month the fibres of the uterine neck begin to develope themselves; they become, as it were, unfolded—the process commencing from above, and by degrees progressing downwards,—and at the end of gestation the cervix is so completely opened out, that it forms part of the general cavity. Figs. 68, 69 and 70. Plate XX. show the gradual change taking place in the neck of the womb. Fig. 68, represents it at the end of the third month; fig. 69, at the end of six months; and fig. 70, just before labour begins.* The enlarged glandulæ Nabothi are also well delineated: and the fissured character that the os uteri sometimes assumes towards the termination of pregnancy is seen in figure 70.

The parietes do not become thinner as the uterus grows, but in many instances absolutely thicker. They are not distended by their contents as a bladder might be blown up; and the cavity is never so completely filled, but that it would hold somewhat more than it contains. The enlargement is dependent on a process of healthy evolution; and if any pressure or distention from within occurs, as is the case when a preternaturally large quantity of liquor amnii is formed, much inconvenience and pain result.

Great as is the increase of the womb in its general bulk, the blood-vessels undergo an enlargement even far more considerable in proportion; and this is explained by the fact that they have not only to nourish the parietes, but also to supply the wants of the growing fœtus. It is this circumstance which renders the texture of the gravid womb so loose and ductile; and the amazing diameter they have acquired before labour commences, most readily accounts for the violent hemorrhages that not unfrequently attend on parturition.

This alteration in the size of the blood-vessels mainly contributes to the increase of the uterine parietes; there is nevertheless an additional quantity of both cellular and fibrous matter secreted, as the evolution proceeds.

* These three figures are about the natural size.

The nerves and absorbents also partake of the general enlargement; though not to so great a degree as the blood-vessels.

For the first weeks of gestation the uterus descends somewhat lower towards the outlet of the pelvis than the position it previously held; and this subsidence often occasions troublesome and annoying symptoms, such as pressure on the absorbents and veins, producing œdema and varices; and on the nerves, causing cramp. Nor do the bladder and rectum escape; and a frequent inclination to evacuate the intestine, but more particularly constant calls to pass urine, are among the many distresses consequent on early pregnancy.

About the end of the fourth month it begins to mount from the pelvis into the abdomen; and its fundus may then be felt emerging above the symphysis pubis. The time of its residence within the pelvis, however, will much depend on the size of that organ. The smaller the capacity, the sooner will it rise; and if the dimensions be preternaturally large, it will remain a tenant of the cavity for a proportionably longer period. In its ascent it passes before the intestines, carrying the omentum up above it; and when it has nearly acquired its extreme bulk, the colon lies along its fundus; and it encroaches in some degree on the space occupied by the stomach. Plate XXI. fig. 71.

It is not to be supposed that these changes can go on in the uterus without the viscera in connexion with it being also materially affected in regard to their relative situations. Thus the neck of the bladder is somewhat drawn up with the neck of the ascending uterus. But the principal alteration is observed in the peritoneum, the Fallopian tubes, the broad ligaments, and the ovaries. The peritoneal covering is of necessity greatly extended in surface; and this depends partly on the formation of new membrane, a fresh secretion,—partly on its allowing itself to be stretched out in every direction, (for it is highly elastic, as is shown in the variations of contraction and distention which the stomach, intestines, and bladder, are constantly undergoing, and in the descent of that portion of the membrane which constitutes the sac in hernia;)—and partly on the layers of the broad ligaments splitting, and receiving the sides of the uterus between their folds. This latter cause occasions the ovaries to be drawn nearer to the substance of the organ than they are in their natural condition; while, from the same cause, both the broad and round ligaments run almost perpendicularly downwards to the pelvic brim, instead of horizontally as in the unimpregnated state. The Fallopian tubes also, from the disposition of the ligaments, lie for some distance upon, and in close approximation to, the body of the uterus. At the termination of pregnancy, the womb measures about thirteen inches in length and eight or nine in breadth; and it has acquired an ovoid figure, Plate XXI. fig. 71.

Fig. 67.

Pl. XX.



Fig. 68.

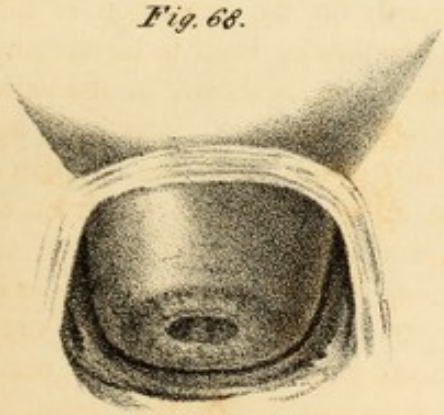


Fig. 69.

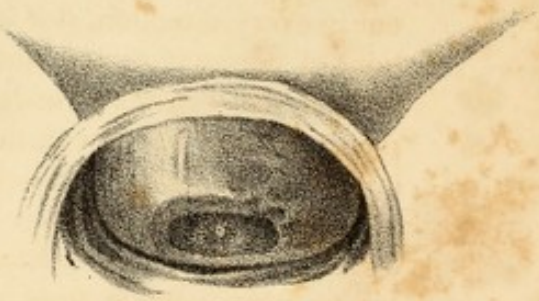
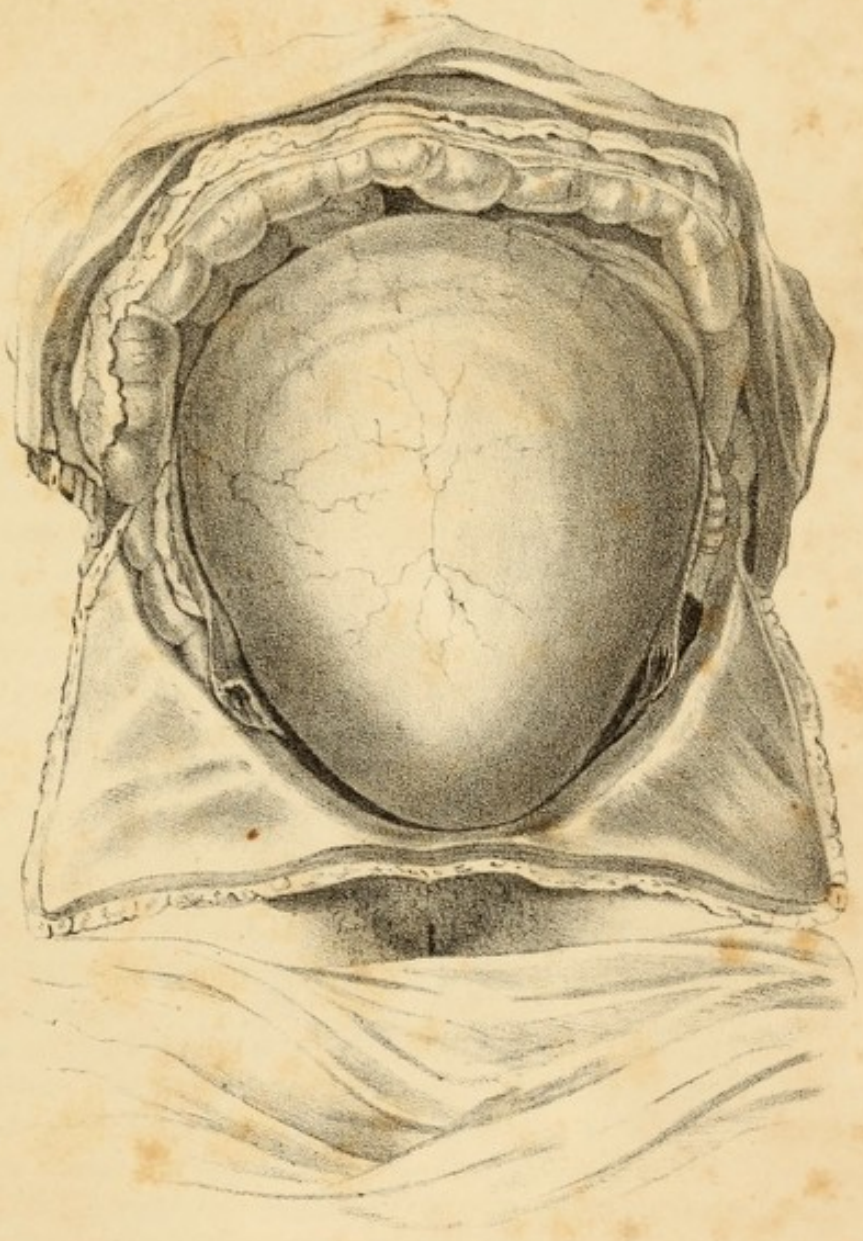


Fig. 70.



Sinclair's Lith.

Fig. 71.



Sinclairs, Li

ON LABOUR.

When gestation is completed, the uterus, which during the period of its growth was inert, allowing itself to be evolved and acquiring a surprising size, begins a new action, which constitutes the function of LABOUR, or PARTURITION. These simple terms designate a very complicated process, embracing the dilatation of the passages, as well as the expulsion of the ovum.

The principal agent in labour is the uterus itself; but it is much assisted in its action by the contraction of the abdominal muscles, and probably also of the diaphragm.

Under labour the fœtus is perfectly passive: so that a dead child is expelled, generally speaking, nearly with the same ease as a living one. The ancients, indeed, thought that the infant, by its own struggles, contributed a great share in procuring its freedom; and Ætius—who lived towards the end of the fifth century, and whose works principally consist of a compilation from those of previous authors—especially mentions the death of the fœtus as one cause of difficult labour; since it could give no assistance, by reason of its being still.* We may presume this was a prevailing doctrine before the time of this writer, and it continued so for many centuries after.†

The action of the uterus is perfectly involuntary, and consists in a contraction of the fibres imbedded in its structure, which indeed form its peculiar parenchyma. These fibres obey in labour the laws of muscular action; their extremities are brought nearer together, and in the same proportion as their length is diminished, they become increased in thickness. Thus, inasmuch as the fibres run throughout the uterus, traversing it in all directions, every part of the uterine structure is lessened in extent, the capacity of the uterine cavity is decreased, and the internal membrane

* Discourse 16, chap. xxi. of Cornarius' translation.

† Vide Mauriceau, livre ii. chap. 10.

is brought into forcible contact with the contents. By this contraction pressure is exerted, propulsion is produced, and eventually expulsion is effected. Even after the child is born the same kind of contraction goes on in the uterine parietes, for the purpose of expelling the placenta, and of gradually closing the open vessels. It is by this contraction that hemorrhage is prevented, and the safety of the patient in that respect ensured.

But the auxiliary muscles which assist the uterus in its contractions are in a great degree voluntary; so that labour may be said to consist of a mixed action; partly of a voluntary, but principally of an involuntary character: for the aid which the woman contributes by the exertion of her own will is not to be compared to the propelling power of the uterus, which is entirely independent of her control.

The general features of labour are the same in all cases, but there is an infinite diversity in the details. Sometimes it is complicated with irregularities and dangers; it is always attended with more or less of suffering, if the patient be conscious. The duration of the process and the pain suffered, vary much in different women, and in the same woman in different pregnancies. The pain endured is sometimes regulated by the strength of the uterine contractions; sometimes by the resistance offered to the child in its passage; but frequently it depends on the degree of irritability or sensibility possessed by the uterus itself. There is no doubt that this organ in some women is much more sensitive than in others; and we may fairly presume that in the same woman it is much more sensitive at one labour than at any previous or subsequent.

The Symptoms of Labour may be classed under two heads:—those which are indicative of the approaching crisis,—and those which intimate that the process has actually commenced.

The symptoms indicative of approaching labour are, first, a subsidence of the uterine tumour; secondly, an increased moisture and laxity of the vagina and external organs;—thirdly, a peculiar degree of mental anxiety.

1st. When about eight months and a half of utero-gestation have passed, the uterus has acquired, not perhaps its largest size, but its greatest height in the person; its fundus has then pretty nearly reached to the ensiform cartilage. But at the end of nine months it has generally sunk back to the situation which it occupied at the end of eight; so that its fundus may be felt half way between the ensiform cartilage and the umbilicus. This diminution in volume occurs indeed sometimes suddenly,—during the course of one night for instance,—and the woman on rising from her bed is surprised to find herself so much less than she was the day preceding. But more frequently it is gradual, almost imperceptible from day to day, but sufficiently obvious after the lapse of several. It is partly produced by painless contraction going on in the uterine fibres themselves, and

partly by the subsidence of the organ within the pelvic cavity. It is to be regarded as a good symptom; for it shows us that labour is disposed to commence in a natural manner; and also—especially is this knowledge valuable in a first pregnancy—that the woman has a tolerably roomy pelvis; for if any portion of the head will enter the brim, while covered by the cervix uteri, it is reasonable to expect that it will readily descend into the cavity when the os uteri is dilated. It is a remark constantly made by women when within a day or two of their confinement, that they are both smaller in size and feel lighter and more active in their persons than they had done for some weeks before. This is, however, by no means a universal occurrence, and it is not to be looked for in cases where there exists a contraction of the pelvic entrance.

2nd. The second indication of approaching labour is increased moisture, relaxation, and distensibility of the vagina and external parts, together with some slight tumefaction of the vulva, the consequence of a larger supply of blood being determined to these organs. This is very apparent not only in the human female, but also in the brute creation. It is very usual; and this, too, is a good symptom, because it shows that there is a disposition in the passages to become relaxed and open, as well as in the uterus to contract. It is dependent on one of nature's unerring laws. Some physiologists would teach us to believe that dilatation in labour is *entirely a mechanical act*—that as the uterus contracts it propels the head first through the os uteri, by dilating it mechanically, then through the vagina, and lastly through the external parts, solely by the same forcible distention. It is evident from the structure of the organs that a mechanical dilatation to such a great extent never could take place, unless a corresponding disposition to relax were given them at the same time; and therefore we must consider the dilatation of the passages *not entirely dependent on mechanical distention;* but that it is in a great measure to be referred to that institute of nature, which induces them to become relaxed and softened, when the uterus is about to commence contraction.

3rd. The third indication of approaching labour is drawn from the state of the mind. We often observe that many days before any painful sensation is experienced, there is a degree of *fidgetiness* or anxiety for the result of the case. This is more strikingly marked in the lower animal than in the human subject. A woman has reason to sustain and guide her; she is confidently impressed with reliance upon a Supreme Power; she has the opportunity of calling to her aid the soothing comforts of religion; and the brute possesses none of these advantages. In our common domestic animals—the bitch, the cat, and others, whom we can watch narrowly prior to the commencement of parturition—we observe that a day or two before the process actually begins, they appear

in great distress: their cries are evidently not those of pain, but—if we may allow it them—of anxiety; and they busy themselves in preparing a bed to which they may retire, when *their time* comes. The same mental distress may be remarked in the female of our own race, modified and controlled by reason, fortitude and religion.

The symptoms which indicate that labour has actually commenced are, first, irritability of the rectum and the bladder; secondly, nausea and vomiting; thirdly, rigors or tremors unattended with any feeling of cold; fourthly, a sanguineous discharge flowing out of the vagina; and fifthly, painful sensations. These are enumerated in the inverse order, in regard to their importance as diagnostic signs.

1st. The frequent inclination to pass urine and fæces, dependent on irritability of the bladder and rectum, arises from the contiguity existing between these organs and the os uteri, their deriving a portion of their nervous supply from the same source, and the consequent sympathy, through which they mutually affect each other. They are very usual symptoms of commencing labour; and are to be attributed to the process of dilatation going on in the os uteri. A desire to evacuate the bladder will perhaps occur every ten or fifteen minutes, although there be scarcely any fluid in it. Medicines are of little avail in this species of strangury; but the feeling mostly disappears as soon as the mouth of the womb is tolerably well dilated; so that before the head comes to occupy the pelvis, it has generally ceased. The same remark may be made with regard to the tenesmus. This symptom is more distressing than the irritation at the neck of the bladder, and it may sometimes be relieved by a simple demulcent injection: if the patient be suffering much annoyance from it, and the labour is progressing but slowly, a few drops of laudanum may be added to the enema with advantage.

2nd. Nausea and vomiting very frequently—indeed almost always—attend on the dilatation of the os uteri; and we have opportunities constantly afforded us of remarking that these two actions bear to each other the relation of cause and effect. It is by no means unusual to find, when the os uteri is rigid during the first stage of labour—when it evinces little disposition to dilate or relax—when this state has continued for hours, and when very little progress has been made in the interval, even although the pains may have been both frequent and strong;—that on a sudden attack of vomiting supervening, not referable to any external cause, a favourable change is speedily produced in the uterine mouth;—it has become softened, relaxed, and is dilated; and the process goes on from that time with comparative rapidity. Hence vomiting at the early part of labour has been looked upon as a good symptom. And it has even been recommended, in cases rendered lingering by rigidity of this organ,

to give emetics for the purpose of exciting sickness, under the impression that the act of vomiting was the *cause* of the relaxation taking place. It is not the cause but the *effect* of that relaxation; so that the artificial production of vomiting is not followed by the good anticipated: emetics are, now, indeed seldom had recourse to with the view of forwarding the dilating process; although nauseating doses of antimony are sometimes employed with beneficial results.

The matter ejected under this attack of vomiting is merely what the patient has lately taken into the stomach, mixed with the healthy secretions of that viscus, and perhaps with a little bile. The effort itself is not attended with much straining; it is more inconvenient than painful. It seldom lasts any length of time:—there are a few paroxysms, and then the affection ceases. Sometimes, however, it will continue to distress and harass the patient for many hours. In such cases it may perhaps be dependent on a deranged state of the stomach itself, or some other cause, besides the sympathy existing between that viscus and the os uteri. The exhibition of an effervescent draught, with five or six minims of laudanum, will then be found the most serviceable as well as grateful medicine. But in ordinary cases no remedies will be required.

Vomiting at the *commencement* of labour, then, may be regarded in a favourable light rather than otherwise, as indicative of the softening process going on in the os uteri. But it behoves us to discriminate most carefully this kind of vomiting from that which takes place under protracted labour, —long after the first stage has terminated, and when the system is worn out and exhausted,—which indeed is one of the very worst signs we can observe. There is not much probability that a mistake should be made in this particular;—the one appears early in the labour; the other most likely after the patient has been in pain a great many hours;—accompanying this there are no symptoms of exhaustion; the woman is in good spirits, the pulse is not much accelerated, and the countenance is not dejected;—with the other there appear progressive symptoms of urgent distress, which will hereafter be especially enumerated. The matter ejected from the stomach would also be a guide, if any doubt existed. In the first kind it consists of what the patient has last taken mixed with the natural secretions; when it is the effect of exhaustion it is a deranged secretion—and this is sometimes formed in astonishingly large quantities; —and in the worst cases it is fœtid, dark in colour, of a greenish cast, or, like the matter vomited in the last stage of typhus fever, possessing somewhat the appearance of coffee grounds.

3rd. Another symptom frequently accompanying the commencement of labour is the occurrence of shivering, or tremors unattended with any sensation of cold. This also is dependent on the opening of the os uteri.

Such rigours are seldom distressing; the patient pays but slight regard to them;—she perhaps feels a little chilly or shivers in a trifling degree, and she may experience many cold fits; but when the os uteri is dilated they disappear. They are neither connected with any irregular arterial action, nor with pain in the head or other bad symptom. Sometimes, indeed, they are sufficiently intense to shake the bed on which she lies, and cause her teeth to chatter as if she were in the cold stage of an ague fit; and although she complains of being very much chilled, the surface may be warmer than natural. It is scarcely necessary to use any other means than to add an extra covering to her person, and exhibit any warm diluent that she fancies.

This simple shivering must be distinguished from that state in which the frame is violently agitated, and which is a species of convulsions of the most dangerous character, that will come under consideration in a subsequent part of this work.

4th. The next symptom to be noticed, is a discharge from the vagina, of a glairy character, tinged with blood, technically termed, in the language of the lying-in room, *a shew*. It consists of an increased secretion from the vaginal surface, mixed with the gelatinous mucus which had previously blocked up the uterine neck, and which is allowed to escape when the os uteri opens; and of blood poured out from those small vessels of the os and cervix uteri, which ran into the deciduous membrane, and which are rendered patulous by the separation of that membrane, as soon as the dilatation of the womb commences.

This is a stronger symptom of labour having commenced than any I have yet mentioned. When, indeed, this "shew" takes place at the full period of pregnancy, or near it,—especially if it be attended with periodical pains,—we may be almost certain, even before we make an examination, that the process has actually begun. A considerable loss of blood towards the close of pregnancy will be sometimes called by the same name. Such hæmorrhages, however, are by no means to be regarded as indications of parturition, unless there be observed mixed in the discharge the glairy gelatine that had before occupied the cervix uteri.

5th. But of all the symptoms announcing the access of labour, pain is the most prominent. This is produced by the contraction of the uterine fibres, and is referred from the uterine region to the loins, to the upper part of the sacrum and the inner side of the thighs. Labour-pain is merely the external evidence of uterine action; and the two phrases are used synonymously as well by all writers, as teachers of obstetric medicine. The sensation of pain is occasioned partly by the sensitiveness of the uterus itself, partly by the resistance offered to the parietes of the organ by the uterine contents, during contraction, and partly by the

pressure of some part of the ovum against the os uteri and vagina under the process of dilatation. So that it has three sources—one dependent on the simple action which, like the spasmodic contraction of muscles, is attended with suffering—another, that of opposed propulsion—and the third, that of distention of the passages. As a general principle, it may be said that the stronger the uterus acts the greater is the pain. In some women painful sensations accompany the very first commencement of dilatation, before the os uteri has attained a diameter sufficient to admit the point of the finger: in other instances, the organ will have been opened to a considerable extent before any pain is experienced; so that labour has made great progress unobserved and unnoticed. These are the cases in which it is supposed that the whole process has been completed by the effect of three or four pains. We cannot imagine that such complicated actions could be perfected by so slight an effort; and we have proof to the contrary daily presented to our observation. The explanation is easy, on the ground that dilatation has been accomplished without any sensation of pain; and that the *expulsive efforts alone* have been attended with suffering.

Uterine action, and therefore labour-pains, may be suspended or removed by many causes: opiate medicines taken into the stomach, injected into the rectum, or rubbed upon the surface of various parts of the body, will usually abate the contractions in a greater or less degree. Passions and emotions of the mind, as fright or sudden surprise, but especially those of a depressing character, such as deep grief, or more transient sorrow, will also produce the same effect. Even so trifling a circumstance as a stranger entering the room when the patient expected her own attendant, has been known to put a stop to labour, in the midst of its most active operations, and to suspend it for many hours. It is principally on this account that we are careful to prevent a woman in labour becoming suddenly acquainted with any news that is likely to shock her.

Labour-pains are not constant, but periodical; they intermit with intervals of ease, as the contractions alternate with relaxations. When the uterus is inactive, there is neither any pressure against its contents, nor any forcing of them through the os uteri, and the painful sensations for the time cease.

At the commencement there is merely a feeling of uneasiness; and when active pains first begin, they are short, weak, and occur at long intervals; by degrees they become more frequent, longer, and stronger; till towards the end of the birth, there is one continued effort at expulsion, lasting, perhaps, for three or four minutes uninterruptedly.

The contractions of the uterus are attended with different sensations, as also with a different expression of suffering at the different periods of

labour. Those pains which depend on the dilatation of the os uteri are described by the woman as being of a *grinding* or *cutting* character. They are accompanied by a moaning noise: if the patient be walking about the room, she will rest on her attendant's arm, bend herself a little forward for a few seconds, utter a subdued, grumbling noise, and then resume her exercise; or, if she be sitting in a chair, she will shrink, as it were, into a smaller compass, press the elbows of the chair with some degree of force, give utterance to the same kind of moaning sound; and gradually stretch herself out again. When, however, dilatation has gone on to such an extent as that some portion of the contents of the uterus is propelled through the mouth low down into the vagina, the pains become of a *forcing* nature; and the expression attending them is very different from that just described. Under these expulsive pains the breath is held in, and the patient forces down and strains as though she were passing hardened fœces. She gives no audible evidence that she is in pain, or perhaps she will make the smothered noise which is usually attendant on a great effort; until towards the close of the paroxysm, when an expression of more acute suffering escapes her. And when the head is resting on the perineum, distending the external structures, and just about to pass out, she cannot restrain herself from giving vent to a loud shriek, or kind of wild cry.

Spurious Pains.—But the presence of pain, even if it be periodical, is not always symptomatic of labour having begun; for towards the end of gestation, women are subject to pains in the loins and bowels, simulating true labour-pains in some respects, but not connected in any way with uterine action: hence they are called *spurious*, or *false pains*. Sometimes they are confined in their situation, at others they are erratic; sometimes they return at tolerably certain intervals; more frequently they are very irregular in their recurrence. They are often connected with dyspeptic symptoms, and sometimes attended with involuntary spasms of the diaphragm and abdominal muscles, which cause the woman to bear down and believe herself in labour. Occasionally, also, a copious watery secretion from the glands of the os uteri occurs, so as to give an idea that the membranes of the ovum have broken; at other times an involuntary gush of urine takes place under the pains, which has often been mistaken for the liquor amnii. If it be urine that passes, it may easily be distinguished by the odour; if a secretion from the glandulæ Nabothi, it will be observed to dribble away slowly, rather than to be evacuated with a sudden burst.

False pains generally come on at night; and not unfrequently they will annoy the patient for weeks before the commencement of real labour,

harassing her much by their severity, and preventing her obtaining any sound, refreshing sleep. At others, they appear only a few hours prior to the accession of uterine action; and in the principal number of instances they are wanting altogether. They are more frequently met with in primary pregnancies than afterwards.

Causes.—Both the seat and causes of false pains are very various. They may be situated in any of the pelvic or abdominal viscera, or in any of the muscles of the lower half of the trunk. Thus the iliaci interni, the psoæ, the abdominal, or the external muscles of the back, may any of them be affected with spasm, consequent on too long a walk, or over exertion, or fatigue of any kind; and these pains are not unlike the throes of parturition. Organic disease of the kidneys or bladder, or a prolapsed state of the latter viscus below the cervix uteri may also occasion the same distress. But the most frequent cause is irritation existing in the lower bowels, or an irregularity in the action of the intestinal canal throughout. Diarrhœa, the evolution of a large quantity of gas, and more particularly constipation, are, of all the many causes, those to which false pains may be most usually traced.

Diagnosis.—It is only in sensation, however, that spurious pains bear any affinity to those of parturition. They differ in their seat, in the irregularity of their return and duration, and in their intensity not progressively increasing; moreover, they are seldom attended by any of the other symptoms which usually accompany the pains of labour. False pains, then, may be distinguished by their situation: instead of commencing at the lower part of the loins, and being extended to the abdomen and thighs, they are probably felt higher up in the back, or towards one or other side;—by their shifting their position: it is seldom that they are constant to one spot, but mostly erratic;—but they may especially be known by the length of their duration and their irregular returns. Thus true pains at the beginning of labour are short, weak, and the intervals between them long; and they increase in frequency and intensity as the process advances: false pains, on the contrary, observe no kind of regularity either in regard to the periods of their return, or to their progressively becoming more frequent or severe.

But the best criterion by which we can distinguish true from false pains is an examination of the uterus externally through the parietes of the abdomen, and internally by the vagina. If the pains be those of uterine contraction, our hand placed upon the abdomen will detect the uterine structure becoming harder, firmer, denser, and somewhat smaller, with each pain, until it arrives at its acmé; it then more or less slowly relaxes, and acquires the same degree of flaccidity which it possessed when the hand was first applied.

Yet it is not in every case where the abdomen becomes harder under pain that uterine contraction is the cause; for it not unfrequently happens that the alteration so perceptible to our sensation is occasioned by spasm of the abdominal muscles. If the fibres of these muscles act irregularly, and embrace the uterus closely, there is communicated to the hand a deceptive feeling of progressively increasing hardness, as though it were the uterus contracting; and it is almost impossible to discriminate between the one cause of pain and the other. But an examination *per vaginam* will at once clear up the difficulty. If, in the inquiry thus instituted, we find the os uteri at all open—even should its diameter be not larger than will admit the point of the finger—if we find that with each pain its edge becomes stretched like a cord around the membranes which are protruded through it—if we find that the membranes are propelled downwards, and become tense with each pain, retreat and become flaccid when the pain goes off—and if with the recession of the membranes we observe that the os uteri also regains its original flaccidity, we may be sure that the tense condition is produced by a propulsion of the uterine contents, and this can only be effected by a contraction of the uterine fibres; so that such pains are certainly those of labour.

But if, on the contrary, we discover that the mouth of the womb is perfectly close—that there is no attempt at dilatation—no possibility of introducing the finger within it, and yet the patient is complaining of violent pain, and using bearing-down efforts, we may be equally sure that the suffering she is enduring does not arise entirely, if at all, from uterine action. Still it is possible, and not unlikely, that the os uteri may be opened to some extent, that we may be able to feel the presenting part of the child; and the pains, notwithstanding, may be spurious—active labour may not have come on. Even here we may distinguish the true cause by ascertaining whether with each paroxysm the disc of the os uteri becomes tense, and whether at the same time the membranes protrude. If there be no change in the os uteri, even although it will readily give passage to the extremity of the finger, and if there be no propulsion of the membranous bag when the pain is urgent, that pain is assuredly not the result of uterine action.

Whenever any doubt exists, it is necessary that these examinations should be instituted,—first, of the abdomen, and then of the os uteri, in order to make the case clear. It is probable, that by merely laying the hand on the uterus exteriorly we may be satisfied that it is not uterine pain; but if that proceeding does not bring conviction, it is right gently and delicately to insist on making the internal examination. The woman may object to this examination being made; but the information we gain by this simple proceeding is so useful, may save so much anxiety and

distress, and so materially regulates our practice, that if deemed absolutely necessary—and unless this be the case, indeed, we ought not to propose it—the point should never be given up. Many a day and night have been spent in anxious watching over a patient, to the great inconvenience of the practitioner, to the destruction of his rest and health, and perhaps to the detriment of his professional character, when there was not the slightest necessity for such close attendance, simply because the patient would not acquiesce in the requisite examination being made.

Treatment.—Since spurious pains are so distressing, since they are producing no good, and since they may so undermine the patient's powers that she may not have strength enough left to go through the fatigues of labour, it is our duty, if possible, to remove them; and the best treatment for that object is rest in whatever posture is most easy, acting pretty freely on the bowels, and the exhibition of opiates, either by the mouth or by injection. If the bowels be loaded, as is most usually the case, opium in the first instance will do more harm than good; but after the evacuation of the intestinal canal, that drug is highly useful. Recourse may also be had to opiate liniments applied to the back, thighs, abdomen, or any other part where the pain is most intense. In plethoric habits, or if there be present inflammatory symptoms, it may be proper to take blood from the arm; but as a general principle, bleeding will not produce permanent alleviation.

In first pregnancies spurious pains are often occasioned by the rigidity of the abdominal muscles, which do not yield as they ought to the enlarging womb. The best means of relief under such circumstances will be found in gentle friction with some emollient application. Care must be taken, however, that this practice be not carried beyond proper bounds; for friction over the abdomen tends to produce uterine contraction, and I have known more than one instance in which liniments rubbed on the part in pain with more than necessary assiduity, and with less than ordinary caution, have excited the premature expulsion and consequent loss of the fœtus.

CLASSIFICATION OF LABOURS.

For practical purposes labour may be conveniently divided into four classes:

1st, Natural,
2nd, Difficult,
3rd, Preternatural,
4th, Complex.

The first class, or Natural Labour, admits of no subdivisions; and it may be defined, a case in which the head of the child presents;—in which not more than twenty-four hours are occupied from the commencement of true uterine action to the termination of the process;—in which nothing extraordinary happens, nothing of a dangerous or alarming tendency supervenes throughout the whole conduct of the case. And that labour is deemed natural, in the acceptation of the term which I offer, if any part of the head present, even although it be the forehead or face itself, provided all the circumstances enumerated concur.

The second class—Difficult—is divided into two orders:

A, Lingering.
B, Instrumental.

To constitute this class, also, it is necessary that the head should present; and the first order defines those labours in which, under a head presentation, more than twenty-four hours is occupied from the commencement to the termination of the case; but in which there is no necessity for instrumental interference, and during the progress of which no dangerous symptoms arise—nothing calling for anxiety occurs, except the unusual lapse of time.

The second order of this class—*instrumental*—embraces all cases of head presentation which require to be terminated by instruments. It includes two species:

a, those cases which can be managed by the use of instruments perfectly compatible both with the life of the child and of the mother, as well as the safety and continuity of the mother's structures; such as are terminated by the forceps or vectis.

b, those in which we are compelled to have recourse to instruments incompatible either with the life of the child, or with the safety and continuity of the mother's structures—labours, indeed, which are completed by cutting instruments.

Of this latter species, there are two varieties—

α, some in which the instruments are applied to the fœtal body; as when the case is terminated by the use of the perforator.

β, those in which the mother's structures are divided by the scalpel, or some such instrument, as in the Cæsarean or Sigaultean operations.

The third class—Preternatural Labours—or, in common language, cross births, includes all cases in which any other part of the child's body than the head presents—the breech, feet, knees, back, belly, sides, shoulders, arms or hands. In this class we recognise two orders—

A, all those cases in which the lower end of the oval formed by the doubled fœtal body offers itself, viz. the breech, or some part of the inferior extremities, as the feet or the knees.

B, those others in which neither the head, breech, nor any part of the lower extremities present. Such are transverse presentations, to which, indeed, the phrase *cross births* ought in propriety to be restricted;—breast, abdomen, side, back, shoulder, neck, elbow, and hand presentations.

INTO THE FOURTH CLASS—COMPLEX LABOURS—may be admitted all those cases which cannot be referred to any of the foregoing divisions; since there are peculiarities appertaining to each which render them both complicated and embarrassing. This class will embrace ten orders, most of them attended with danger, and all with irregularities.

A. Labours complicated with dangerous hæmorrhage.
B. ——————————— convulsions.
C. ——————————— rupture of the uterus.
D. ——————————— lacerated vagina.
E. ——————————— ruptured bladder.
F. ——————————— descent of the funis before the head or breech.
G. ——————————— descent of one or both hands with the breech.
H. ——————————— syncope unconnected with uterine floodings.
I. Labours in which monsters are produced.
K. Labours complicated with purality of children.

Three circumstances must strike the attention on this enumeration; first, that there are a number of cases assembled together in one class, without their possessing any affinity to each other; secondly, that some of them are in the highest degree dangerous, while others must not be considered more than ordinarily so; and, thirdly, that in some of them the danger or irregularity is referable to the parent, and in others to the child. Thus, in cases of laceration and convulsions, the cause is to be sought in the system of the mother; but where the funis or hand descends by the side of the head or breech, the irregularity is referable to the ovum, and the cause may be attributed to the arrangement of the contents of the uterine cavity. Each of these orders might indeed be considered a separate class; but I think it better to comprehend them under one general head, in order to prevent a multiplication of classes, which in all nosological arrangements must be both inconvenient and perplexing.

NATURAL LABOUR.

Plates XXII., XXIII., XXIV., XXV., XXVI., XXVII., XXVIII., XXIX.

Stages of Labour.—Most writers agree that it is desirable, for the purpose of clearly understanding the process, to divide labours into certain parts or *stages;* but as there is much difference in the classification adopted by different teachers, so also a diversity has obtained in the number of these stages; some preferring three, as Denman, Hamilton, Blundell, Thatcher, and most modern teachers; others four, as Merriman, Velpeau, Romer of Zurich, Bard of New York; and others, again, five, as Hogben, Naegelè, and the German school;—all these stages terminating on the removal of the placenta. I think Denman's arrangement by far the best for practical purposes, and shall therefore describe labours as consisting of three stages: the first terminating with the opening of the os uteri to its full extent, the rupture of the membranes, and the evacuation of the liquor amnii; the second, with the birth of the fœtus; and the third, with the expulsion of the placenta. We might with some show of reason add a fourth stage, considering that to end with the complete closure of the uterine vessels, and the stoppage of every chance of hæmorrhage: but as this last might continue throughout the whole puerperal month, or longer, it may be as well to follow the more ordinary usage, and to regard labour as terminated on the removal of the placenta.

First stage—dilatation of the os uteri.—The first stage,—that which depends upon the dilatation of the os uteri from its perfectly close state to that of its full diameter,—is generally the longest, the most uncertain in time, and the most tedious both to the attendant and the patient. This stage varies exceedingly in every feature, as, indeed, do all the others. There is a great difference observable in different women, and in the same woman at different labours, in the state of the os uteri soon after the commencement of the process. In some it will be found soft, lax, and yielding,—though not dilated, still dilatable; while in others it is hard, firm, rigid and unyielding,—not allowing itself to be distended at all by the finger any more than a piece of hard leather would. There are four chief varieties of the os uteri, during the first stage of labour, as to its character. The first is when it is thick, soft, moist, cool, sensible to the touch—but not painfully so,—having very much the feel of a piece of thick, wet, chamois leather. The second variety is when it is thick, hard,

and rigid; perhaps also hot, dry, and tender, and gives a sensation to the finger very much like the touch of a piece of cartilage. Under the third variety, the os uteri is thin, soft, moist, cool, and not painful, its edge feeling like a piece of moist brown paper; and so thin, that through the substance of the cervix the head of the child can be pretty distinctly felt. The fourth is when it is thin also, but hard and rigid, tender or not according to circumstances, having a glazed feel, with its edge surrounding the presenting part of the child, and tightly embracing it, like a piece of whip-cord. Under one or other of these varieties we shall always be able to arrange each state of the os uteri soon after the commencement of labour. It may be regarded as most likely to dilate kindly, when it possesses a soft thick feeling, like a piece of wet chamois leather, and is, as it were, chinked. Certainly either of the two soft states gives a better indication of a disposition to dilate, than those which are rigid; and it may be also deemed least inclined to give way, when it is thin and hard, and when the head comes down into the pelvis completely covered with the cervix uteri,—the circular edge resembling whip-cord, or wire.

Varieties in the time occupied in dilatation.—As there is almost every variety in the state of the os uteri at the commencement of labour, so also there is great diversity in the time occupied in its opening; sometimes two or three hours only, at others the same number of days, are consumed in the progress of the first stage; and the os uteri of the same woman will differ much in this respect in her different labours.

Variations in the height of the os uteri.—We also find the os uteri varying exceedingly in situation at the commencement of labour; it is sometimes so high, that we can scarcely feel it when the finger is introduced, as in a common examination; and at others it is so low, that it is met with just within the vagina, and the presentation may be detected through the cervix. A more speedy termination may be expected, *cæteris paribus,* when the head has descended somewhat into the cavity of the pelvis, than when the os uteri is felt nearly at the brim; unless, indeed, the cervix should possess the thin, glazed, hard feeling that I have just described; when we are to anticipate a lingering labour. It is generally to be found about two inches from the vulva, looking backwards to the upper joint of the coxyx, and it is readily discovered by the fore finger of the right hand, or, at any rate, by the first two fingers of the left hand introduced into the vagina.

Relative progress of dilatation.—Again, we observe that the first part of the dilating process usually goes on slower than the after part. Thus, that degree of dilatation under which the organ acquires the diameter of a shilling,—sufficiently large to admit the tips of two fingers,—will perhaps take up a longer period of time than its dilatation from that small size to

the full and entire dimension, which easily allows the head of the child to pass through it. This partly arises, perhaps, from the natural disposition in the os uteri to open more readily after it has acquired a certain diameter; but it is owing also in some degree to mechanical action; for when it has become expanded to such an extent as to admit the membranous bag, or any portion of the child's head to occupy its aperture, the protruded part acts like a wedge, and forcibly distends it. The cause, however, is not entirely and purely mechanical, for it depends in a great measure on the principle of vitality.

Generally speaking, the os uteri dilates with more pain and difficulty, and takes a longer time in the process, during first labours than subsequently. This is by no means a universal remark, although we usually observe that, when women have had a number of children, the dilatation proceeds with comparative ease. Denman accounts for this facility by the observation—"We may presume that a part which is accustomed to perform an office, or undergo a change, acquires a readier disposition to the office or change, according to the number of times it has performed that office, or undergone that change."*

It is quite impossible that we can give even a probable guess as to the time which any particular os uteri will require for the perfection of its dilatation; for sometimes one that has been from the commencement of the labour highly rigid, scarcely showing the least disposition to open, will suddenly become relaxed, and rapidly distend its circle to its full dimensions; while at another, though the part is soft and flaccid, the pains will altogether subside without any apparent cause; the process of dilatation will be suspended, and the labour will remain stationary for hours, without in the least progressing.

The pain experienced during the first stage, although not so intense or acute as in the second, is still more difficult to bear; and is also borne generally with less fortitude. It is, as I stated before, of a different kind from the pains of expulsion; it is a feeling as if some inward part were being torn, or rent asunder. Perhaps it is not altogether in consequence of the peculiar sensations experienced, that the patient does not endure these early pains with so much resignation as those of a more expulsive character; but also from the knowledge which she has gained, either by a previous labour, or in conversation with her friends, that so long as the "grinding" pains continue, there is no chance of a speedy release; but that, as soon as the "forcing" pains come on, the labour may quickly be brought to a close; and *every next*, she thinks, may terminate her sufferings. As soon as the pains become changed in their character, hope is

* Introd. to Mid., chap. ix. sec. 6.

infused, fresh spirits are instilled, and thus the patient's powers are sustained.

If the labour be progressing regularly, the pain subsides and again returns; thus intermissions alternate with paroxysms of suffering; and if the woman be in other respects well, and in good spirits, she will often fall into a dose, and obtain a refreshing slumber during the intervals of uterine action: each pain, when it returns, awakening her from the delicious state of oblivion and repose, to a fearful consciousness of the trials she has to undergo.

Rupture of the membranes.—With each pain the membranes are more or less protruded through the os uteri, so that they become tense, and the circle of the dilated mouth is drawn tightly around them. Plate XXII. fig. 72, shows the membranous cyst passing through the mouth of the womb, and occupying a portion of the vagina. In the interval of pain, when the uterus exerts no pressure from above, the membranes retreat, become flaccid, and are scarcely to be felt; and as there is little or no water then intervening between the finger and the person of the child, its presenting part can usually be distinctly discerned. Such a state of alternate protrusion and retrocession of a part of the membranous cyst continues an uncertain time; when under one of these painful contractions the membranes will burst, the liquor amnii will be evacuated, and the head of the child will come to bear, with each paroxysm, against the internal surface of the os and cervix uteri. On the breaking of the membranes, the first stage of labour has terminated.

Variations in the period when the membranes rupture.—I have thus described the progress of a labour prior to the rupture of the membranes, taking it for granted that the liquor amnii will not be evacuated until the os uteri is dilated to nearly its full extent; but these two occurrences,—the full dilatation of the os uteri, and the rupture of the membranous cyst,—are not always found in practice to correspond with regard to time: for sometimes the membranes break before the aperture is dilated even to the size of a shilling; while at others they protrude considerably through that organ before they rupture; the head of the child having descended so low as to occupy the cavity of the pelvis, and the os uteri having been widely open for some considerable time. Generally the membranes burst when the mouth of the womb has become dilated to a size sufficient to admit the hand; and we may presume that where such a degree of dilatation exists, the next two or three pains will expel the head entirely through its orifice.

According as the membranes are more or less rigid, and the mouth of the womb more or less yielding, will be the time consumed previously to the discharge of the waters. When the os uteri is soft, and the mem-

branous bag tough, it will probably be long before this evacuation takes place; but when it is rigid, and the membranes are thin and tender, they generally break early. The period at which the membranes rupture, therefore, will not only depend upon their own toughness or tenuity, but it will also be regulated by the pressure which the edge of the os uteri exerts on them while they are protruded through it. The more lax is the os uteri, the less is the compression on the extruded portion of the cyst, because it then distends to the power operating from within: but if it be rigid, the pressure is great; for then the inner margin closely and strongly embraces the tense membranes all around, producing by its very resistance a deep circular groove; and thus disposing the bag to premature laceration.

It is desirable in practice to preserve the membranous bag entire as long as possible; or, at least, until it has performed the whole of the office destined for it by nature; namely, the dilatation of the os uteri, the vagina, and somewhat of the external parts. When the membranes appear externally to the vulva, indeed, we may suppose that they have then effected all the good that can be expected from them; that their remaining entire may possibly be retarding the labour; and we may in that case venture to rupture them, provided the head present. But it is one of the first axioms to be learned in obstetric practice, not officiously or unnecessarily to destroy the cyst, so long as any advantage can be gained by its dilating powers.

Second stage—Passage of the Fœtus through the Pelvis.—From the foregoing remarks it may be gathered that, after an uncertain time, the os uteri becomes fully dilated; the membranes burst; the liquor amnii is evacuated, generally in a full stream; and the second stage of labour commences.

Modes in which the vertex presents.—The passage of the head through the brim of the pelvis forms the first part of the second stage. It is probable, indeed that the head may have descended considerably into the cavity before the waters flow away; but it is also possible that it may scarcely have engaged itself even in the brim, when this crisis in the process occurs. It has been already shown, that of all the points of the head, the vertex is most usually presenting; and it has also been proved that this is a most wise and beneficent provision of nature, because in that position the fœtal skull will pass through an aperture of less dimensions than in any other. The vertex then depending, there are eight different directions in which the head may be placed, requiring our consideration, in a view to practical utility. The first is with the face inclining to the right ilium; the right ear being behind the symphysis pubis; the left ear

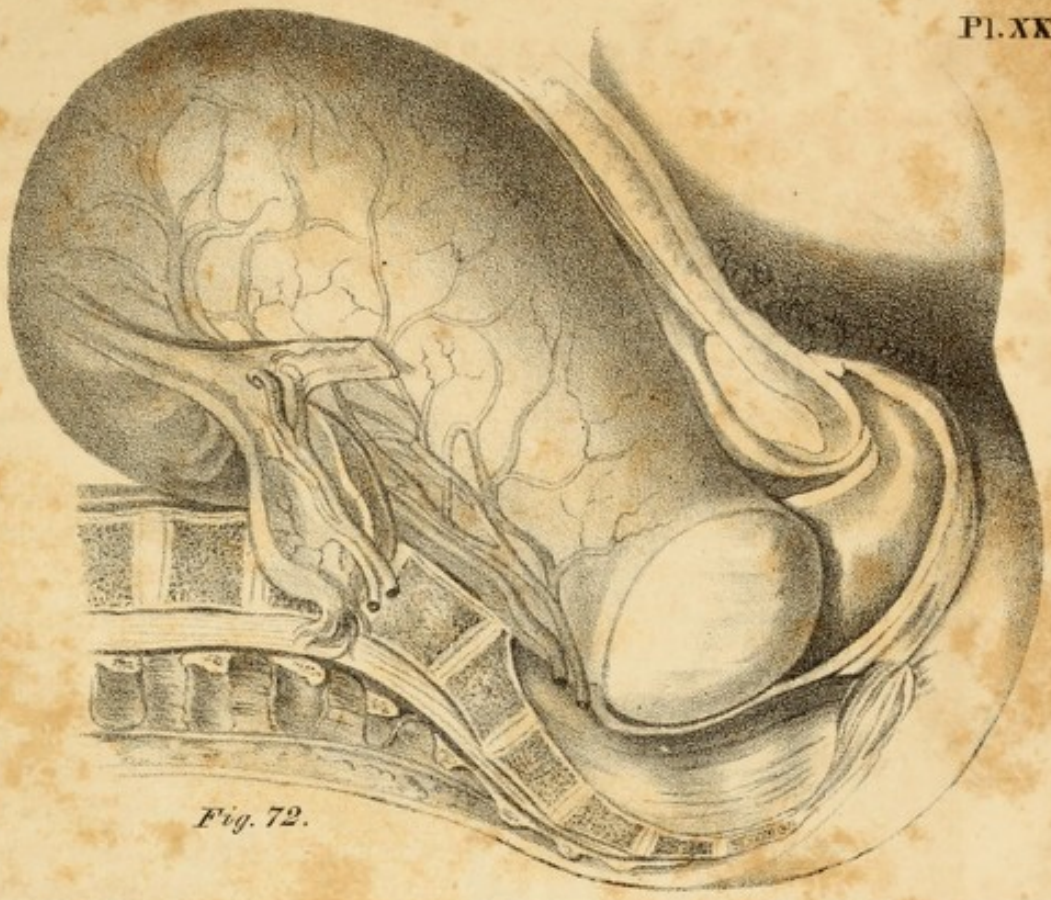


Fig. 72.

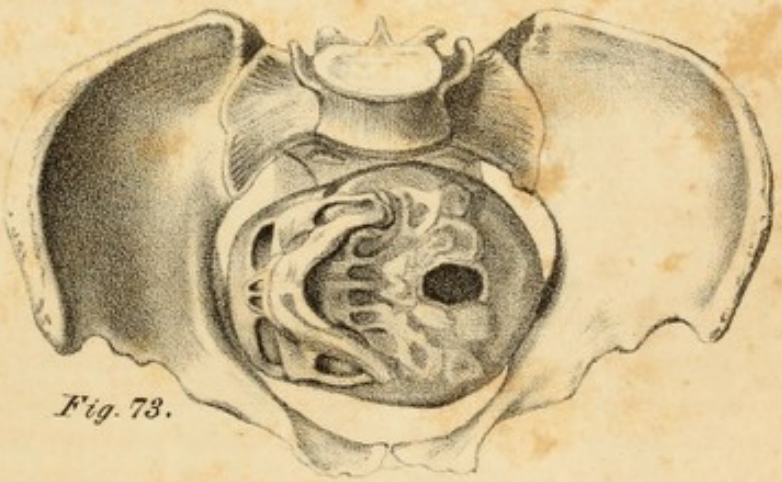


Fig. 73.

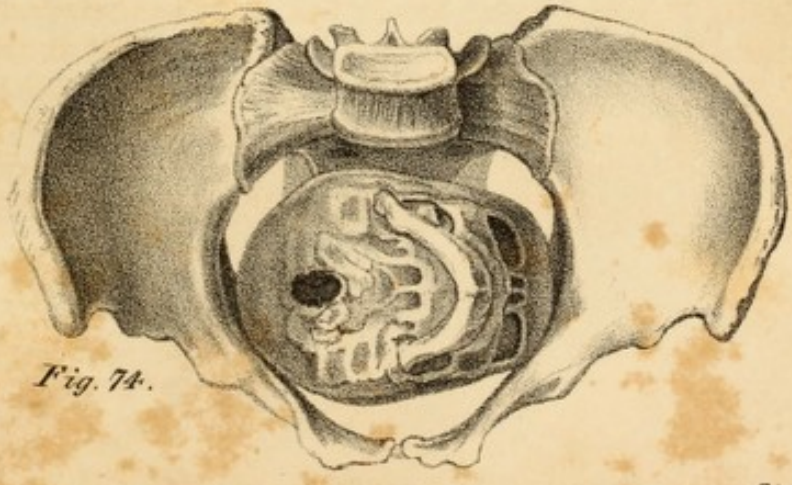


Fig. 74.

Sinclair's Lith.

towards the spinal column; and the occiput inclined to the left ilium. Plate XXII. fig. 73. The second is the reverse of this position; the face inclines to the left ilium; the occiput to the right ilium; the right ear lies towards the promontory of the sacrum; the left ear behind the symphysis pubis. Plate XXII. fig. 74. The third mode is, when the head is placed diagonally, the face looking to the right sacro-iliac synchondrosis; the right ear to the right groin; the left ear to the left sacro-iliac synchondrosis; and the occiput behind the left groin. Plate XXIII. fig. 75. The fourth position is the reverse of this again, where the face is placed against the left sacro-iliac synchondrosis; the occiput behind the right groin; the right ear against the right sacro-iliac synchondrosis; and the left ear behind the left groin. Plate XXIII. fig. 76. The fifth position is where the face is looking towards the right groin; the occiput to the left sacro-iliac synchondrosis; the right ear to the left groin; and the left ear to the right sacro-iliac synchondrosis. Plate XXIII. fig. 78. The sixth position is where this is reversed, the face looking towards the left groin; the occiput to the right sacro-iliac synchondrosis; the right ear to the left sacro-iliac synchondrosis; and the left ear to the right groin. Plate XXIV. fig. 77. The seventh is where the head attempts the passage with the forehead immediately against the promontory of the sacrum; the right ear to the right ilium; the left ear to the left ilium; and the occiput behind the symphysis pubis. Plate XXIV. fig. 79. And the eighth, where this position is reversed, the occiput being exactly against the promontory of the sacrum; the forehead impinging on the symphysis pubis; the right ear to the left ilium; the left ear to the right ilium. Plate XXIV. fig. 80.

Comparative frequency of the various modes of vertex presentation.—Of these presentations, the first four are by far the most frequent;—that is, when the face either looks directly to one ilium or the opposite; or diagonally to one sacro-iliac synchondrosis or to the other. Under either of these positions, the natural inclination of the head is to descend into the pelvic cavity in the same direction in which it cleared the brim until it reaches the outlet, and then to turn with the face into the hollow of the sacrum, and the occiput under the arch of the pubes, the face being expelled, sweeping the perineum. When such is the original situation of the head, the labour is more easily accomplished than under any other. It is supposed that the face is more commonly inclined towards the right side than the left; and this accords with my own more recent observations.

Of the next four presentations, the fifth and sixth are the most frequent, viz. where the face is looking diagonally to one or other groin, and the occiput to one or other sacro-iliac synchondrosis. These are not very frequent cases, but they are occasionally met with, and the head is seldom

so speedily expelled as in either of the first four. In these situations, the natural inclination of the head is to pass down diagonally till it comes to the outlet of the pelvis, and then to turn with the face under the arch of the pubes and the occiput into the hollow of the sacrum. Much more room is required for the exit of the skull with the face forwards, than when it is thrown back into the sacral curve; because its general figure is then not so well adapted to the pelvic cavity; but especially because the expanded brow does not so easily insinuate itself between the rami of the pubic arch as the more conical vertex does. For this reason, the occiput is pressed more powerfully backwards before expulsion takes place; the coxyx is put more upon the stretch, and the perineum is also more extended.

Yet, although the natural inclination of the face would be to appear under the pubes in its exit when it was originally directed to either groin, it is by no means uncommon for the head, in its passage through the pelvis, to turn with the face into the sacral cavity, and to be expelled in the same manner as though the face had from the commencement been inclined laterally or diagonally backwards. These irregular positions of the head are frequent causes for the necessity of instrumental interference.

The seventh and eighth cases of vertex presentations—where the face attempts the passage, being placed directly against the promontory of the sacrum, or above the symphysis pubis—are the most infrequent of all the eight; they are so rare, that some practitioners of considerable experience tell us they never met with them. Naegelè* and other German authors deny the existence of such a case; and Campbell† doubts the possibility of its occurrence.

As in the early part of this work it was demonstrated that the fœtal cranium, from occiput to forehead, measures four inches and a half, while the sacro-pubal diameter of the pelvis at the brim possesses only four inches of clear available space; it is evident that, although the head might present in the seventh or eighth position, it cannot enter the pelvis in either of those directions. Before, then, it can engage in the superior strait, it is compelled to turn, with the face somewhat towards the right or the left side. I have certainly never been called upon to deliver by instruments when the head occupied either of the unfortunate situations now under discussion; but I have known them to obtain at the commencement of labour; and I have traced the head make a turn with the face to one or other side, being forced into that position by the strength of the uterine contractions, in an analogous manner to the turn effected in all

* Essay on the Mechanism of Parturition. By Rigby, preface, p. 16.

† Introduction to Midwifery, p. 244.

Fig. 75.

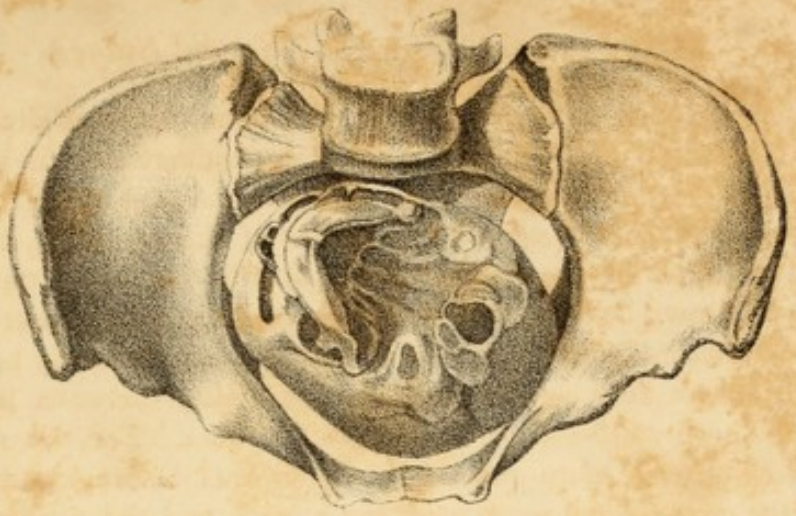


Fig. 76.

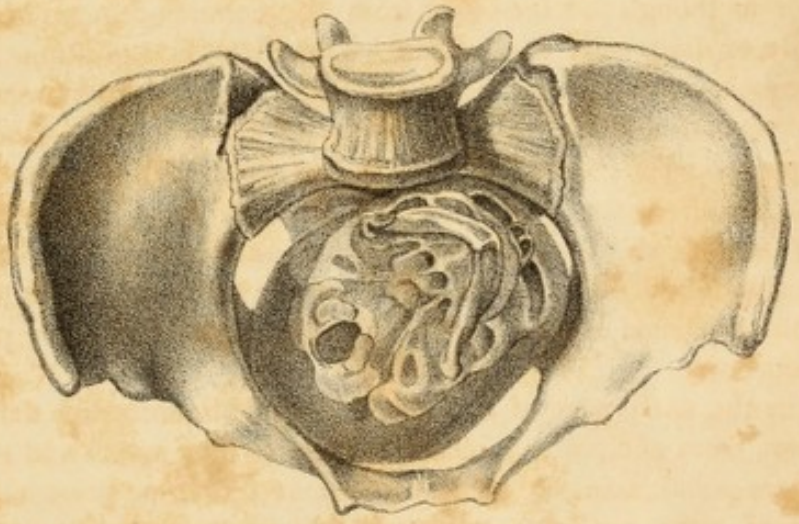
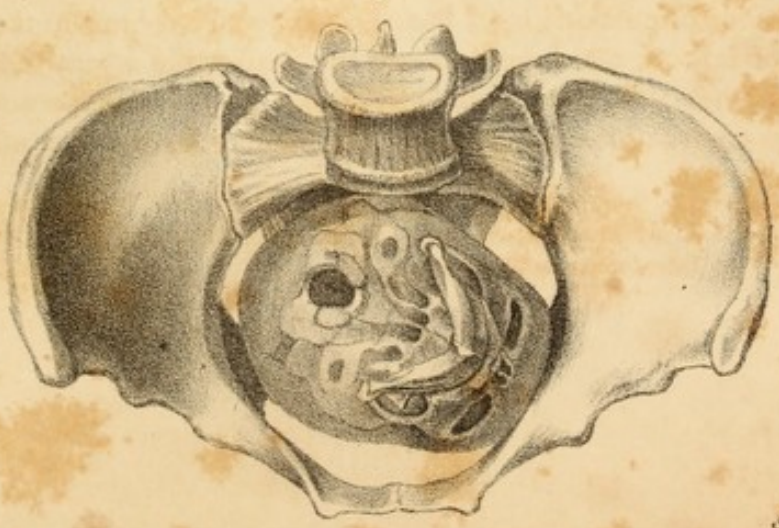


Fig. 77.



Sinclair's Lith.

Fig. 78.

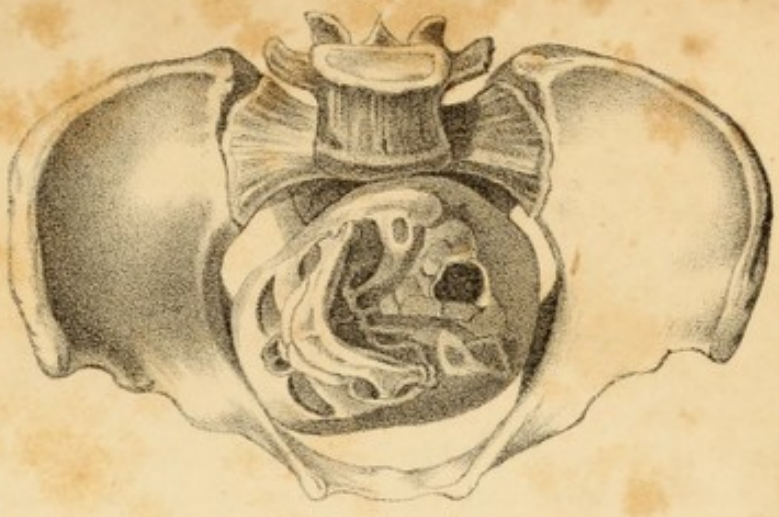


Fig. 79.

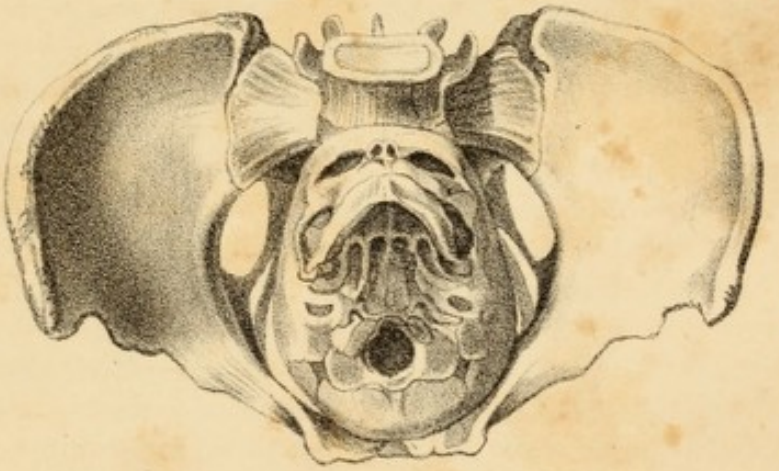


Fig. 80.



Sinclairs, Lith.

pain; that it becomes lax, and the water recedes, when the pain goes off. The same thing also happens with regard to the head, so far as protrusion and retrocession are concerned. After the membranes are broken, it is forced a little downwards with each contraction; and in the absence of pain retreats, sometimes to a considerable extent. This is particularly remarkable when it is passing through the outlet of the pelvis. At that period of the labour it may be almost entirely expelled during the urgency of the pain; and when remission occurs, it will recede and be again perfectly buried within the genital fissure, so that the labia close around it. To such an extent is this recession sometimes carried, that it may give those not well acquainted with the process an idea that the uterus has ruptured, and that the child's body has passed partly into the abdominal cavity. And here again we cannot help remarking the beauty of nature's ordinances: it is impossible, indeed, to contemplate a single provision, even of the minutest character, adapted to the exigencies of gestation and labour, without being fervidly and awfully impressed with the extent of that Wisdom, Power, and Beneficence, which established the laws, and controls their operations.

The advantage of this retrocession consists in the removal, for a time, of that distending pressure which obtains when the head is propelled downwards. If there existed a constant urging forward, without the least relief to the parts, throughout the whole progress of the labour,—even under the most common natural case, in which not more than the usual time was consumed,—the soft structures must suffer very considerable injury; the vessels must be more or less strangulated; the circulation would be suspended or impeded; inflammation would almost be a necessary consequence; and gangrene would generally follow. We are, therefore, to hail this recession of the head in its progress through the pelvis as a fortunate occurrence for the woman; since it relieves her from present pain and future danger. It is also to be regarded as a good sign, inasmuch as it proves that the cavity of the pelvis is tolerably capacious.

When the head has entered so low into the pelvis that the forehead and occiput impinge respectively on the internal surface of the tuberosities of each ischium,—inasmuch as the long diameter of the head, while in this situation, is opposed to the short diameter of the pelvic outlet, and exceeds that diameter by half an inch, it is impossible for it to escape in that direction. A change is consequently effected: the face is thrown into the hollow of the sacrum, and the occiput under the arch of the pubes. This alteration in position, however, does not commence until the head is fully lodged within the pelvic cavity. Plate XXV. fig. 81, shows the head occupying the pelvic cavity, the face being directed to the right side.

Fig. 81

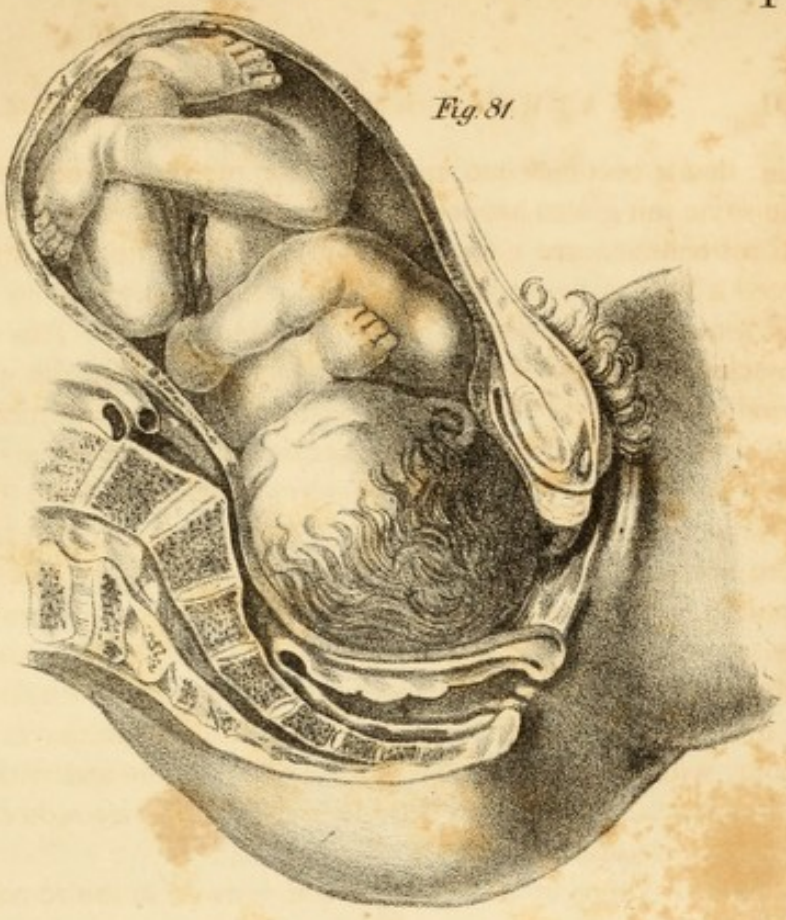


Fig. 82.



Sinclair's Lith.

Compression of the head.—We also remark—especially in first labours, or any case where there is much resistance—that the head, from pressure, assumes somewhat of a conical figure, the bones of the cranium overlapping each other, so as to diminish the lateral diameter. In consequence of this decrease in volume, the scalp becomes corrugated,—puckered at the vertex into three or four folds, very evident to the touch, and observable, *cæteris paribus*, in the same degree as the head is compressed. Pressure to such an extent is seldom injurious. After a time, however, when the head has remained long within the pelvis, and especially if it be impacted, this corrugated feeling of the scalp disappears; and instead of it, a soft puffy tumour is observed in the same situation.

While the head thus continues in the pelvis, both before and after its turn is effected,—being compressed by the pelvic bones, and reciprocally exerting equivalent pressure on the soft structures within the cavity,—another most distressing symptom often arises, bringing with it great increase of suffering, but not generally interfering with uterine action, or retarding the progress of the labour;—I allude to cramp, of the most violent character, affecting the calf and sole of the foot. This is consequent on the compression to which the great sciatic nerve is exposed at this stage of the process; and is so painful that the patient can scarcely restrain her screams.

Exit of the head.—The vertex, then, of all the cranial surface, first appears externally, and as it descends lower and lower, the labia become opened; the anus dilated; the perineum distended, heated, and very much thinned; so that it feels almost like wet vellum. Plate XXVI. fig. 83, copied from Smellie, the child's head *a*, is seen separating the labia; the extension, thinning, and protrusion of the perineum *b*, caused by the head's descent, and called by some *the perineal tumour*, are also well portrayed; *d* marks the point of the coxyx; *e* the anus dilated, so that the inner membrane of the rectum is to some extent exposed to the contact of the hand, when applied for the protection of the structures. This exposure is not injurious; no harm arises from it; and sometimes it is even greater than is represented here. In this way, retreating when the pain goes off, and advancing when it returns, the face sweeps along the sacrum, coxyx, and perineum; the chin slowly recedes from the chest; the occiput turns up under the arch of the pubes; the perineum slips back over the partially extruded face; and the head is by degrees expelled. On its entire expulsion the face is directed towards one or other thigh. Plate XXVI. fig. 84.

During the passage of the head externally, the pains are even more forcing than have yet been experienced: the woman bears down more strongly, makes a greater effort, and calls forth the utmost power of the

abdominal muscles and diaphragm, to aid the uterine contractions. It appears as if all the vital energies were directed towards the accomplishment of the object nature has in view: most of the muscles of the body participate in the general struggle; a violent trembling, which it is impossible to control, frequently pervades the whole frame; and at the moment the head emerges, a piercing shriek will mostly escape the patient, as though involuntarily. When the head is on the point of passing, the contents of the rectum are usually squeezed out; and on its entire protrusion, the perineum, from its own elasticity, recovers its former size and appearance; it is collected round the neck of the child,—the woman is completely relieved from the distending force, and consequently from the agony she endured. She will now generally express some strong sentiment of gratitude and joy; or perhaps her feelings will only find utterance in tears.

Under all states of the system, the sudden removal of intense pain brings with it a sensation of positive pleasure; and in no case is the instantaneous transition from extreme misery to actual joy more conspicuous than immediately on the delivery of the head; and this especially if it be a primary labour; to which, indeed, the preceding remarks are more particularly applicable. A longer interval of ease will probably follow the expulsion of the cranium than had occurred since the perineum first began to be extended. In a very few minutes, however, action is is again established, for the purpose of completing the delivery.

Exit of the body of the child.—After the head has effected its turn, with the face into the hollow of the sacrum, and is passing through the outlet of the pelvis, with its long diameter in the same direction as the long diameter of the inferior aperture,—namely, from the fore to the back part,—the shoulders are at the same moment entering the cavity, and passing through the brim, with their long diameter in the same direction as one of the long diameters of the superior aperture, which is diagonally from side to side; so that the child is here adapted, both as it regards its head and its shoulders, to the pelvis, in such a way as to make its transit the most easily. Plate XXV. fig. 82, represents the face traversing the sacral cavity, after the head has made its turn. The shoulders are seen passing through the brim, with the left directed towards the right groin, and the right opposite to the left sacro-iliac symphysis; the original presentation of the head having been the vertex with the face to the right ilium. In most of the plates which describe this position of the fœtal head, the body is also turned quite round, with the abdomen looking directly towards the mother's spine. From repeated observation, I am persuaded that this is not correct; that the body still in utero is not turned in the same proportion as is the head; and that the cervical, dorsal, and lum-

Fig. 83.

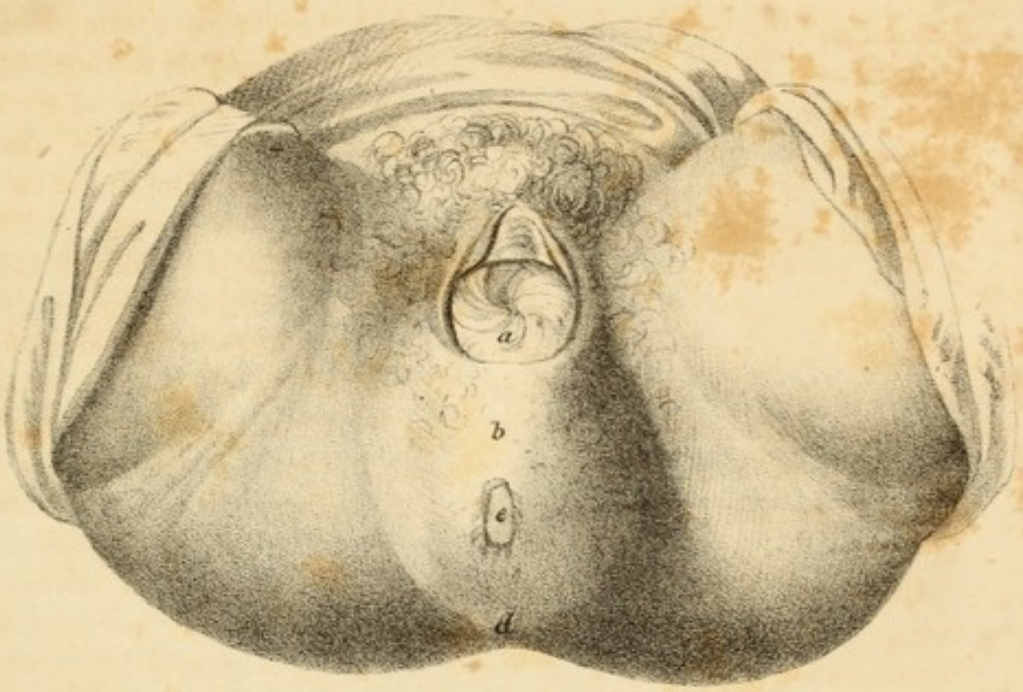


Fig. 84.



bar vertebræ are somewhat twisted; so that the breach and lower part of the trunk retain their original situation in regard to the mother's body, although the head has been so materially altered in respect to that which it occupies. This is proved by the child's face being directed to one of the woman's thighs immediately on its expulsion. After the head is born, however, when the shoulders have come down to press upon the outlet of the pelvis, their long diameter is opposed to the short diameter of the outlet, and they seldom can make their exit in this situation, unless the child be small or ill-formed: but most usually they also effect a turn, similar to the turn already described by the head; one of them being directed into the cavity of the sacrum, and the other insinuating itself under the arch of the pubes. Through the inferior aperture of the pelvis, then, the child is expelled sideways, one shoulder and arm distending the perineum, and the other offering itself anteriorly. Plate XXVI. fig. 84. One pain may be sufficient to effect this turn and expel the shoulders; or two or three may be required.

When the fœtal body is so far protruded that the parts are again distended by the shoulders, the patient experiences a return of pain; not such violent agony, certainly, as when the head was being expelled, but the same feeling of forcible distention,—the same sensation as if the parts were being rent. A short time only elapses before the uterus resumes its action, to expel the breech; the child in the interval remaining half born, the perineum somewhat on the stretch. As the breech takes up less room than either the head or shoulders, it is usually extruded with slight exertion; the legs and feet either pass directly, or remain a minute or two in the vagina, and are ultimately expelled by the vaginal fibres: the birth of the child is then perfected, and the second stage of the labour brought to a close.

The time occupied by the passage of the child, after the rupture of the membranes, is as uncertain as the period required for the dilatation of the os uteri and the accomplishment of the first stage. Sometimes the same pain under which the membranes burst, expels the head, and perhaps the body also; at others, very many hours of wearying suffering are sustained before the head emerges; and the same uncertainty with regard to time applies—but in a very limited degree—to the passage of the shoulders after the head is born; sometimes scarce a moment intervenes, sometimes a considerable space; usually, however, the child is entirely expelled within five minutes after the head has passed.

The symptoms of a speedy termination to the labour are, that from the beginning we should find the os uteri lax, soft, thick, moist, cool, and not tender; that we should find the vagina also soft, moist, relaxed, and cool,

and the perineum easily distensible; the pelvis well formed; the head directed with the face laterally, or looking diagonally backwards, with the vertex downwards. With such indications, if the woman be in good health, and the pains pretty active, we may expect a speedy termination to the case.

The symptoms foreboding a tedious labour are exactly the contrary to those I have just mentioned:—that we should find the os uteri thin, hard, unyielding, dry, and tender, and feeling round the presenting part of the head as if a cord were tightly encircling it; that the vagina and perineum should be dry, hot, narrow, and constricted; that the head should be wrongly placed; the pelvis small; or the uterine action feeble: any of these features displaying themselves will indicate the probability of a protracted struggle.

Usually, when the os uteri has been preternaturally rigid, the soft structures towards the outlet of the pelvis are also indisposed to yield, and the labour is therefore tedious from the commencement to the close: but this is by no means always so; for sometimes these parts will give way very easily after the os uteri has opened with great difficulty; and in other cases they will be very rigid, when the os uteri has dilated tolerably easily. It may be looked upon as a general rule, that the vagina and perineum are least disposed to dilate in first labours; and this observation is more universally applicable to them than to the mouth of the womb. We very seldom, indeed, find either of these organs more rigid in subsequent labours than in the first, unless that rigidity is the consequence of a cicatrix produced by sloughing. It is possible that after a difficult labour inflammation of the vagina may occur, which may terminate in slough; the slough will separate, the ulcer will heal, a puckering will take place, and a cicatrix will be left; by which processes the capacity of the canal is much diminished, and its dilatability impaired: but this is an accidental occurrence, and must be reserved for future consideration.

Third Stage.—The second stage being terminated on the birth of the child, the third consists in a continuation of the same efforts for the expulsion of the placenta.

Varieties in the time occupied in the expulsion of the placenta.—This stage also varies much in respect to time: if the uterus be vigorous and active, the placenta is generally expelled quickly; but if uterine action has been feeble during the former parts of the process (particularly if the labour has been lingering, or the child has been extracted by mechanical means,) a comparatively long period usually elapses before it passes. In some instances, indeed, the uterus does not act to expel it at all, and the introduc-

tion of the hand is required for its removal. I have sometimes known the placenta thrown out of the vagina by the same pain that expelled the child: more frequently, ten, fifteen, or twenty minutes elapse, before it escapes wholly from the uterus into the vagina, and even then it may lie in that cavity for hours before it clears the os externum. Those contractions, by which the expulsion of the placenta from the uterus is effected, are also attended with suffering; not, indeed, nearly approaching the violence of the pains under which the fœtus was born, but more like the uneasy sensations experienced during the commencement of the first stage: they are referred principally to the loins and upper region of the sacrum, and are scarcely complained of. It is seldom that a single pain expels it even out of the uterine cavity; more frequently three or four follow each other, at tolerably regular intervals; and it descends into the vagina by degrees.

When it has passed from the uterus—if the case be left entirely to the natural powers—the muscular fibres of the vagina complete its extrusion; but as this canal has suffered severe and unusual distention during the birth of the child, we cannot expect that the muscular coat will regain its previous tone in an instant, so completely as to embrace the mass firmly and expel it immediately. It consequently remains within the vagina, until the fibres have recovered sufficiently to act upon it. This requires a very different period in different instances: sometimes five or six hours will elapse; most usually it is protruded within the hour.

Separation of the placenta from its uterine attachment.—Previously, however, to the placenta being expelled out of the uterine cavity, it must be separated from its uterine attachment. This separation is produced exactly by the same action which causes its extrusion,—uterine contraction. After the birth of the infant, the general volume of the uterus and the capacity of its cavity being diminished in proportion to the degree of contraction it has undergone, it necessarily follows that the uterine surface, before occupied by the placenta, is proportionably decreased, and shrinks into a less space.

As the placenta is a perfectly passive body—as there is no power inherent within its own structure, by which its maternal face can be diminished in any degree corresponding with the diminution of the internal surface of the uterus—the very shrinking of the uterine parietes occasions it to lose its former hold; it spontaneously falls from its attachment, and would remain loose in the uterine cavity, unless extruded by a continuance of uterine action. This simple contraction, then, causing the uterine membrane to slip away from the placental surface, both separates it from its connexion and expels it from its cavity. The placenta passes through the

vagina inverted, so that its fœtal face becomes external; the membranes attached to it are also turned inside outwards, and are flapped over its maternal surface. There is always a loss of more or less blood accompanying the separation of the placenta; and this blood appears externally upon the linen. The quantity varies to a great extent; sometimes it does not exceed an ounce or two; at others it amounts to many pints, constituting a most violent hæmorrhage.

Even after the placenta has been expelled from the uterine and vaginal cavities, the process of uterine contraction does not cease, but continues for the purpose of arresting the flow of blood by the closure of the vessels; for preventing the possibility of the womb being inverted; and for silently and gradually decreasing the bulk of the organ to its former small unimpregnated state. Should the uterus not contract, in proportion to the flaccidity of its parietes, the distensibility of its cavity, and the perviousness of its vessels, would be the danger of hæmorrhage. It does not perhaps necessarily follow that dangerous flooding must occur, even although the contraction were imperfect; because it is possible that coagula might form at the open apertures of the uterine vessels which were previously closed by the apposition of the placenta; and if the heart's action were not powerful enough to dislodge those coagula, the loss of much blood might be by them prevented. But this kind of plug is a most inefficient security against all varieties of uterine hæmorrhage; and no woman can be considered safe from flooding until the uterus is firmly, entirely, and permanently contracted.

Every one who has seen much of obstetric practice must have been struck with the fortitude and resignation with which women bear the agonizing throes of parturition, and the rapidity with which the system recovers from the lengthened suffering, and regains its average balance. This must be regarded as one of Nature's greatest mercies; but there is this grand difference between the pain of labour and all other pains—the one is unnatural, and dependent on morbid actions, influencing for the time the condition of the organ affected; the other is natural, and inseparably connected with the performance of a healthy function.

Duties of the Medical Attendant under natural labour.—From the knowledge which the foregoing pages will afford of the beneficence displayed by nature throughout the processes of utero-gestation and labour; and of the admirable contrivances adopted by her to overcome difficulties and avert dangers, it will be evident that in a very large proportion of cases the duties of the obstetrician must be few and simple. Generally, indeed, no *active* assistance is necessary, until after the birth of the child;

all that is required of the attendant being, that he should remain an observant, though unofficious, spectator of the process;—ready to exert himself, with promptitude and energy, on the first accession of any alarming symptom; but equally, or more, ready to allow the changes necessary for the completion of nature's object to proceed, uninterrupted by any meddlesome interference: for no maxim in obstetric science is of more universal application, than that unnecessary "assistance,"—rendered with the view of expediting the termination of the case, or shortening the sufferings of the patient—is not only useless, but in the highest degree injurious, and well calculated to defeat its own end.

Let it not be supposed this declaration includes the admission that a *partial* acquaintance with the obstetric branch of medicine is sufficient for the safe practice of the profession; for although, in thirty-nine cases out of forty, little is required to be done beyond protecting the extended structures from injury, separating the child, and extracting the placenta from the vagina—after its total exclusion from the uterine cavity—still, in the fortieth, danger may occur, only to be arrested by the promptest, the most decisive, and most judiciously directed help.

Much knowledge is necessary to discriminate the kind of cases in which assistance is proper, and determine the time at which that assistance ought to be employed, as well as the mode of its application. It is this which distinguishes the scientific from the ignorant obstetrician;—it is this important knowledge on which the life, the future health and comfort of many a parturient woman must depend;—which, nevertheless, has been held in such low estimation by some members of the profession, as to be thought unworthy of cultivation by the scientific and literary mind;—unfit to be possessed by men of respectable station in society; and the adaptation of which knowledge to practice has been characterized in an official document under the seal of the highest of our medical corporate associations, as "an art foreign to the habits of gentlemen of enlarged academical education."*

No one can read this sentiment without feeling that it is both inconsiderate and unjust. To omit, indeed, any particular mention of the science and judgment requisite to treat such perilous accidents as hæmorrhage, in all its varieties, and convulsions, a most important question,—involving no less than the destruction of fœtal life,—is often painfully forced upon the attention of the obstetric practitioner. He is by no means very unfrequently called upon to decide whether the delivery can safely be trusted to the natural powers, or requires to be terminated by artificial aid; and

* Letter from the Royal College of Physicians to the Secretary of State for the Home Department, dated May 2d, 1827, in reply to a memorial from the Obstetric Society.

whether means may be used compatible with the child's safety, or the horrible alternative must be had recourse to, of sacrificing the infant to preserve the mother.—Is it of no importance that this should be determined by an educated, intelligent, and *practical* man?—Is it right that questions of such vital interest should be left to the decision of one but *partially* qualified to answer it?—And can we suppose that any person can form a proper estimate of the powers with which nature is endowed to surmount the impediments, and overcome the dangers, that occasionally embarrass parturition, unless he have the opportunity continually before him of watching her operations in the more ordinary cases?—For these, if for no other reasons, the interests of the public must be best protected when the obstetrical branch of medicine and surgery is undertaken,—in common with the other duties of those sciences,—by persons who have qualified themselves, by their medical studies, for the conduct of the most dangerous casualties, and who are entitled, by their rank in society, and their preliminary education, to the consideration of gentlemen.

It can scarcely be necessary that I should insist on the obligation we lie under to obey every summons to an obstetric patient as speedily as possible: for even although a former one may have been lingering, it by no means follows that the subsequent labours should be of the same nature; and a practitioner must subject himself to much annoyance and blame, if, through remissness or negligence on his part, he should find the case terminated on his arrival. It is always right—however little is required to be done—that the medical attendant should be present during the chief period of the process, that he may be at hand to employ such means as any emergency may render requisite.

A lancet and a female catheter are the only instruments with which the obstetrical practitioner need furnish his pocket case; sufficient time will generally be afforded him for procuring any others he may want, even in the most urgent cases. He will find it convenient, however, especially in country practice, to carry with him two or three drachms of laudanum.

It is not often that we are called upon to choose the apartment in which the woman should pass the puerperal month, as she is usually delivered in her own bed-room; but if that advantage be afforded us, we should make choice of one that is spacious and airy, with a dressing-closet or ante-room attached to it, and at a convenient distance from the domestic offices.

Nor, perhaps, are we generally expected to regulate the number of individuals to be present; though we may be called upon not unfrequently to exercise our authority in this respect. Bearing in mind that the room

should be kept as noiseless as possible, there are yet some attendants whose services we cannot dispense with. The only persons whom I would willingly admit are the nurse and some female married friend,—the mother, or other near relation, or an intimate acquaintance,—to act as confidante to the sufferer, into whose sympathizing ear she may whisper all her grievances and distresses, and from whom she may receive those numberless comforts and sustaining consolations of which she stands so eminently in need. Unmarried females are neither the most fit companions for the patient, nor the most useful assistants to the practitioner. In addition, it is proper that a servant should be in attendance in the ante-room, or close at hand, that she may be ready to bring whatever may be wanted from a distant part of the house without delay; and she should have no duty imposed on her for the time, except an obedience to the orders that may issue from her mistress's chamber.

On arriving at the patient's residence it is better not abruptly to obtrude oneself into her presence, unless there be some immediate necessity for our attendance. Information should be sought from the nurse on such points as will enable us to judge whether labour has actually commenced. On being ushered into her chamber, we may engage her in some general conversation, which will give us an opportunity of observing the frequency, duration, strength, and character of the pains; and our conduct must be framed accordingly. Should they be of trifling importance, we may content ourselves with giving some ordinary directions, and retire from the apartment. But if they are returning with frequency and activity, we must not allow much time to elapse before we require to make an examination *per vaginam*.

An objection may be raised by the patient to the necessary examination being then instituted, under the idea that *no assistance* can be rendered her so early in the labour. As I would regard the feelings of a parturient woman in a degree only secondary to her safety, I would by no means insist on putting her to this inconvenience, unless I thought it quite indispensable. But, as much valuable information may be gained by this first examination, and as it is highly desirable to obtain that information during the progress of the first stage, it is right firmly but gently to urge its propriety. It is seldom, indeed, that she will not accede to the recommendation of her medical attendant, provided he possesses her confidence, and conveys his request with becoming delicacy.

Much knowledge must be acquired during the first vaginal examination: it is, first, whether the woman be pregnant; secondly, if she be in labour; thirdly, whether the membranes have ruptured, or are still entire; fourthly, how the child is presenting; fifthly, how far the labour is advanced;

and sixthly, the state of the os uteri, vagina, and perineum, in regard to their distensibility.

It may be thought superfluous to recommend that one of the points of inquiry should be whether pregnancy really exists, under the supposition that no woman could believe herself in labour unless she had approached near the termination of utero-gestation. But instances are daily occurring which prove the fallacy of this mode of reasoning; and on many occasions professional men have been in attendance for days and weeks, relying on their patient's assurances, perhaps often advanced, that she was with child, when it has turned out she was mistaken. They have thus most undeservedly exposed themselves to some censure, or, what is perhaps more mischievous than direct censure, to quizzical innuendos and sarcastic ridicule.

Many unhealthy actions will cause the abdomen to swell,—especially about the period of the cessation of the menstrual discharge,—and to simulate the external appearance of gestation; and even in the absence of pregnancy, spasms of different muscles may sometimes tolerably closely imitate, as to sensation, situation, and severity, the commencing pains of labour. While this gradual enlargement is going on, the woman will find no difficulty in persuading herself, or in being persuaded by others, that she is pregnant; and when the spasmodic pains set in, she will as readily conclude that labour has begun. Under such circumstances, the medical attendant has probably no opportunity of forming a correct judgment, except from his personal observations at the time he is hastily summoned.

Provided the uterus be unimpregnated the deception may generally be detected, simply by placing the hand on the abdomen; but if that proceeding does not afford the required information, an examination *per vaginam* can scarcely fail to prove satisfactory. On placing the hand on the abdomen externally, it will be found distended—perhaps from flatus pent up in the intestines—perhaps from fluid effused into the peritoneal cavity—or from the presence of some more solid tumour. We may distinguish that the swelling is softer or harder, larger or smaller, more diffused or more circumscribed, than is the bulk of the gravid uterus; that it is not of the same shape, is very likely irregular on its surface, does not occupy the same position, and above all, that it does not possess that peculiar springy elasticity which so strongly characterizes the impregnated womb at the end of the natural term of gestation. If there still remains any doubt, it is right to make a vaginal examination. Under this condition of *spurious pregnancy* the os uteri will be found not only close, but undeveloped; the cervix not expanded; and the uterus itself, on poising it at the extremity

of the finger, will be felt small, light, and moveable;—provided, indeed, it be not diseased. If, on the contrary, the patient be pregnant, and near the end of the term, we shall find the os and cervix uteri fully developed and expanded, and perhaps the os uteri somewhat open; so that we may be able to detect the presence of a fœtus through the dilated mouth or thinned neck.

But the patient may be pregnant and not in labour,—the pains may be spurious and not true. If what has been already advanced in regard to false pains be carefully studied, I trust there will be no great difficulty in forming a diagnosis. We will presume, as indeed we shall find most usually the case, that the patient, on our arrival, is in the first stage of labour, experiencing the dilating or *grinding* pains.

Position of the patient.—The most convenient as well as easy posture which the patient can take, and that which seems best adapted for facilitating the descent of the head through the pelvic brim, is the one usually chosen in this country—the left side, with the shoulders inclined forwards, so that the spine may be somewhat curved, the thighs flexed upon the pelvis, and the legs bent upon the thighs. In this position, as has been before shown, the axis of the pelvic entrance is brought, as nearly as can be accomplished, into a line with the axis of the trunk; and the muscles passing over the pelvic brim, particularly the psoæ, are more perfectly relaxed than in any other.*

It is better that she should be undressed, excepting her night-clothes and a dressing-gown; and that she should lie on a mattrass rather than a softer bed. She should be also covered by a light counterpane, or blanket, and a sheet.

In this position *the vaginal examination* is to be conducted in the following manner:—The attendant sitting rather behind her, and having anointed the first two fingers of his *right* hand with some unctuous substance, mostly in readiness, is to place them on the labia externa; then gently separating these organs, he must introduce the first finger into the vagina in the direction of its entrance, which is backwards and upwards: or he may take the perineum as his guide, and insinuate his finger within the genital fissure, posteriorly, close to the fourchette.† Having introduced

* In many parts of the continent the women are delivered in the half-sitting, half-recumbent posture. In France they lie on the back, with the thighs extended and the knees drawn up. In other countries they sit upon the knee of an assistant. The peasantry of Ireland place themselves on their hands and knees; and Mr. Michell (on the Ergot) states, that in Cornwall it is difficult to persuade a woman in labour to take any other posture than either standing or on her knees.

† The object of covering the finger with some oily substance before making an examination, is two-fold: partly because the lubrication assists its introduction, but partly also to dimi-

it as high as he conveniently can, he must pronate his wrist so that the junction of the first and second finger shall fit in under the symphysis pubis. Plate XXVII. fig. 85. In this way he will be able usually to reach the os uteri without difficulty. Should that organ, however, be situated so high that he cannot perfectly command it,—rather than remain in ignorance of its condition, and of the presentation of the child,—he may introduce the first two fingers of his *left* hand, fig. 86; and as these may be passed higher within the pelvis, they will give a greater facility for inquiry.*

These examinations are commonly made during the urgency of pain; and this has given rise to the phrase of "trying a pain." It is, however, desirable, on many accounts, that we should not introduce our finger up to the os uteri at the time when the uterus is acting strongly; because then the membranes are protruded into the vagina; and if we press against them at that moment, we may probably rupture the cyst, and lose its influence in the after progress of the labour. Besides, it is impossible under such protrusion to ascertain the presenting part of the fœtus with precision, because of the quantity of water, which is then interposed between our finger and its person. Nevertheless, as it is expected that we should examine while the uterus is in action,—and, indeed, as in many cases the patient would not allow us to pass our finger at all, were it not for the belief that we can assist her, and that only in the time of pain,—it is necessary that we should request her to inform us when there is a return, and take that opportunity of introducing our finger within the external parts. Having gained this advantage, we must allow it to remain inactive in the vagina, while the pain continues; and upon its cessation, which we have seldom any difficulty in ascertaining, we may direct it up to the os uteri.

The condition of that organ with respect to its actual dilatation, and its dilatability, whether the membranous cyst is ruptured or is still entire, the presentation of the child, and the degree of relaxation which the vagina and the perineum have already taken upon themselves, will all become matters of observation during this primary examination.

nish the chance of inoculation with morbid matter, should the patient be labouring under any venereal affection. Three of my intimate medical friends have suffered most severely from secondary symptoms of syphilis communicated in this manner; and five different mid-wives of the Royal Maternity Charity have been the subjects of the same disease, contracted through an abrasion of the cuticle, while in attendance on women in labour. These are grievous accidents, and no means should be left unused, by which such a serious consequence may be avoided. If, unfortunately, a suspicious looking sore should make its appearance on the finger, all obstetric duties must be abandoned until after it is healed; for another woman may be infected from the contact of an open chancre on the hand of the medical practitioner.

* The two figures in Plate XXVII. show the os uteri in the process of dilatation, and the mode of examination; fig. 85 displays it but slightly opened; fig. 86, when it has acquired a greater diameter.

Fig. 85.



Fig. 86.



Sinclair Lith.

In regard to the first of these points, it is not always easy for a novice to distinguish the mouth of the womb at the commencement of labour. I have known many students attend a number of cases before they had been able to detect the os uteri by the feel, or satisfy themselves where it was situated. I have before stated that it will generally be met with about two inches or two inches and a half from the vulva, looking back towards the sacrum or coxyx.

Being satisfied that we feel the os uteri, we must next ascertain whether the membranous cyst has broken or not. It is not always easy to determine this point either in the *interval* of uterine contraction; because the membranes being then flaccid, retreat, together with the contained fluid, within the uterus; and there remains merely a thin skin, as it were, between the finger and the presenting part of the child; so slight, indeed as scarcely to be perceptible to the touch. But as soon as pain returns, the soft wedge, if unbroken, is again felt protruding through the os uteri, and there is then no difficulty in detecting it. If, therefore, we have not been able to learn, in our first examination, whether or not the liquor amnii is evacuated—inasmuch as we have carried our finger up to the os uteri in the *absence* of pain,—we may take the opportunity of examining again when the next contraction comes on; and on passing the index finger up to the pelvic brim while the pain is urgent,—most carefully, lest we should rupture the sac prematurely,—if we distinctly feel them protruding downwards into the vagina, we know that the membranes are still entire.

Again, it is of first importance that we should ascertain what part of the child presents, even before the membranes rupture. The necessity, indeed, of determining the presentation previously to the discharge of the waters, is denied by some obstetricians of great authority.*

With such a dangerous sentiment I can by no means coincide; considering it imperative on every practitioner—provided the labour has made any progress—not to leave the patient's room until he has perfectly satisfied himself that it is the head which offers at the brim: for as occasionally transverse presentations occur—as, under such a malposition, it requires that a change in the situation of the fœtus should be artificially made before the birth can be perfected—and as that change is comparatively an easy operation previously to the bursting of the membranes, but is rendered one of the most difficult in surgery, if much time is allowed to escape after the evacuation of the liquor amnii—so it necessarily follows that the advocates of such a doctrine run the risk of lulling their disciples into a perilous and fatal security. It is certainly not always an easy matter to distinguish the presenting part at the onset of labour, by the first finger of the

* Blundell's Principles of Obstetricy by Castle, p. 235.

right hand, because, occasionally, it lies too high for detection in that manner: but it is seldom that some part of the child's body cannot be felt, if two fingers of the *left* hand be introduced into the vagina; since they will almost always command the whole cavity of the pelvis, and may be passed up to the very brim. Whenever, then, any doubt arises as to the position of the fœtus, it is much better to have recourse to this second expedient than to remain in ignorance of so material a point.

Discriminating marks of a head presentation.—The head is distinguishable by its large volume, its roundness and firmness, and by its constituent bones being intersected and separated from each other by open lines and spaces: for it seldom, when the os uteri is dilated to the size of half a crown or a dollar, that we cannot detect some portion of a fontanelle, or one of the sutures. There is little chance of any other presentation being mistaken for the head, except the breech, and perhaps (as I have known happen) the side. The breech is most likely to be confounded with the cranium, because it possesses a larger circumference than any other part of the child's body, except the head; but it still differs from the head materially in its general size, and more particularly in feeling to the finger softer—not so resistant, but more *cushiony:* it is also more pointed, and possesses no structure resembling a suture or fontanelle. The principal discriminating marks of the presence of the breech, however,—of which I shall speak more at length hereafter—are the anus and genitals. The only point of structure in the side that bears the least shadow of resemblance to the head, consists in the interosseous spaces between the ribs; one of which might possibly be mistaken for a cranial suture. If it were worth while drawing distinctive marks between these two parts, I might observe, that at the commencement of labour under a side presentation, the body of the fœtus seldom descends upon the brim, or into the pelvic cavity, so readily as when the head offers itself; the shoulder and breech being then supported by, and resting upon, the respective ilia. It is, therefore, generally quite out of the reach of the finger, until after the membranes have broken; and this of itself would be a suspicious circumstance. Secondly, the space between the ribs is wider than any suture of the head—unless, indeed, the fœtus be hydrocephalic; and, thirdly, we may usually detect more than one interosseous vacancy. Now, as there are no two sutures in the cranium that run in parallel lines, if we can trace more than one such space by the finger, we can be at no loss to determine that they are both intercostal.

Having ascertained by the marks enumerated that the head presents, we may be content with this information; it is by no means necessary, or desirable, at present, that we should perplex ourselves with endeavouring to make out the nice distinctions between the different parts of the head,

so as to say exactly whether the face is directed to one side or the other; or whether the vertex presents, or any other point. It is sufficient that we have assured ourselves the head is at the brim; and we may take it for granted the vertex offers, unless, indeed, we can clearly distinguish the marks of some other part. This recommendation is not given to impress the student with the idea that it is enough to make a careless examination, but to prevent his doing harm by any attempts to inform himself on such a difficult matter—harm by irritating the vagina and os uteri—but especially by prematurely rupturing the membranes, which it is highly necessary to preserve whole. For in irritable habits we shall often find that the most simple examination is sufficient to cause an accession of uterine pain; and if—only intent on ascertaining how the head is situated, without reference to the preservation of the bag—we carry our finger round, within the os uteri, we shall most likely induce action; and the membranes will be more or less suddenly protruded against its extremity. The finger then passes into the centre of the aqueous cyst, the liquor amnii discharges itself, and irreparable mischief is done. Let us then—if we have clearly distinguished the head over the os uteri—presume that it is placed in the most favourable position for its descent into the cavity of the pelvis, until the membranes have given away. We may after that proceed to examine the presenting part more accurately; and, provided the labour does not progress favourably and satisfactorily, we must take pains, in all cases, to learn whether the delay be owing to the malposition of the head; or to some other of the many and various causes that may retard its advance.

When the first examination has been made, the patient herself, and her friends, are always anxious to learn from the medical attendant if all be natural and satisfactory, and how long is likely to elapse before the labour will be terminated. With regard to the first question if we have gained all the information which I require we should do, we may give a decided answer; but the second must be evaded. If we find the vagina distensible, the os uteri dilated, the head presenting, and the pains sufficiently active; we may reply, with a positive assurance, that so far every thing is favourable; that no case can afford a more auspicious promise than the one under our care; and that, therefore, we are warranted in anticipating a fortunate result: to the second question, let us not attempt to reply. Let us take it for granted, after such a positive declaration of good tidings, that *it* will not be repeated; and, as society is at present constituted, whoever obtains a plain, straight-forward answer to one out of two questions, ought to consider himself fairly dealt with. But if the party we are addressing thinks differently,—which we shall most usually find the case,—and presses the subject again on our attention, let us tell them plainly, they ought to remain content with the

honest declaration we have given, that the case is progressing as favourably as possible; that it is out of the scope of human knowledge, and consequently quite out of the power of any human being, to say positively when the labour will be terminated. Any opinion we might form would be but a guess at the best; and it is not fit that we should trust an answer, which may involve such serious disappointment, to conjecture. If we were to make a promise, that the labour would be brought to a close either at noon or midnight, or any other specified moment, we may be disappointed in two ways. It is very unlikely that it should end just at the period of time we have mentioned; it might be earlier, and then an inference might be drawn, that we knew nothing about the case: but it is also probable, that the time fixed upon will pass by, without our promise being fulfilled; it will then act most injuriously on the patient's mind; she loses confidence,—that loss of confidence is attended with dejection,—the nervous system is depressed,—and the process of labour is more or less interfered with. By making promises of this kind, indeed, we may be the means of producing a lingering, painful, dangerous, an instrumental, and perhaps a fatal case. Upon such trifles, sometimes, does the welfare of our patient depend!

Frequent examinations should not be made during the first stage of labour:—we can do no good by such a practice, after we have once gained the information we require; we cannot facilitate the descent of the child; we cannot dilate the parts; but we may do a great deal of injury; for we denude the vagina of that soft relaxing mucus which is designed by nature to protect it, and we moreover run the risk of destroying the integrity of the membranous cyst: we may, therefore, predispose the parts to inflammation, and retard the dilatation of the os uteri itself. As, however, it is a common idea among women, that, under each examination, material assistance is rendered, we shall frequently be urged, during the first stage,—especially if the labour be rather slower than usual,—to remain in close attendance on the patient's person; and these solicitations are generally advanced with a degree of fervency that it appears the extreme of cruelty not to accede to. Should this be the case, the finger may be introduced from time to time, with the greatest care and gentleness; more to pacify the patient's mind, and assure her she is not neglected, than with any other view beyond that of merely watching the progress of dilatation. The more rigid the parts are, the more do they require the softening influence of the natural secretion, and the more careful must we be to preserve it.

A question naturally arises, whether we shall remain in the bed-room, or may with safety return home. It is not right that we should stay in the same chamber with the patient, during the first stage; because there

is a frequent inclination to pass urine and fæces; and she will be compelled to restrain that desire, as she will probably not like to be constantly requesting her medical attendant to retire. It is not necessary for us to remain with her; all that is required being, that we should overlook the process, and be at hand to act on any emergency occurring. We may retire, then, from the room, and direct the nurse to inform us, if the pains become stronger, and particularly if the membranes rupture. In about an hour—should we receive no summons in the mean time—we may see her again, and may then, if we think it right, make another examination, to ascertain that the labour is proceeding satisfactorily. But, if it is not necessary for us to continue in the chamber, or by the bed-side, is it desirable for us to return home? In this question, the comfort and convenience of the medical attendant are much interested; and its answer must depend, in a great measure, on circumstances;—such as, whether it is a first or subsequent labour; whether the previous labours have been quick or lingering; how far the os uteri is dilated or dilatable, and particularly the distance of her residence. If it should not be above a few minutes' walk from one house to another, it is not necessary that we should stay at the commencement of labour; but if the distance be great,—especially if the patient have had children before, and her labours have been quick,—even should the os uteri not be dilated more than to admit the point of one finger; provided the pains are following each other rapidly, it is better not to leave the house. As a general principle, I would advise, that in all cases, as soon as the os uteri has acquired the diameter of half-a-crown, sufficiently large to admit the points of four fingers just within its disc, the attendant should not be absent from the house for more than a quarter of an hour or twenty minutes at a time; because, although it may have taken five or six hours to dilate from a close state to that dimension, the subsequent process of dilatation may go on so rapidly, that a few more pains may accomplish the delivery; and that before he can arrive.

Some practitioners recommend, that, although our presence is not required in the lying-in chamber, still we should not occupy ourselves in any employment or amusement, while we remain in attendance. They argue, that, inasmuch as we receive a consideration for our time and service, our whole mind should be entirely devoted to the woman's safety, and in suggestions for her comfort. With this sentiment I entirely disagree. I grant that we ought to afford every necessary and proper attention, whether we are remunerated or not; but, in common cases, such an entire devotion of our mental faculties is not required; and we may produce a hurtful impression by our apparent anxiety. It is natural for a man, who is not of an indolent disposition, but whose mind is usually directed to some object, to become *fidgety*, if his attention be not occupied by any

pursuit; he will, perhaps, be pacing the drawing-room, where the husband is sitting; and by a mere absence of manner, which he can scarcely disguise, he will convey an idea that he is more than ordinarily anxious on account of the lady. Such an impression will find its way through the crevice of the door to the lying-in chamber; it will reach the invalid herself, and is likely to produce all the disadvantages which result from depressed spirits. Let him occupy himself, then, in some way that best suits his taste, either writing or reading; and there are few books he may chance to take up but will afford him both amusement and instruction.

It is by no means requisite that the patient should continue in one posture during the first stage; she may relieve herself by changing her mode of lying, by sitting up, or walking about the room; for she will soon be able neither to sit, stand, nor walk, but will be compelled to take a definite position on the bed, from which, in ordinary cases, she is not to move till after the termination of the labour.

She may be allowed any bland, fluid nourishment, that she fancies; but it is very little she requires. The attendants about her are usually solicitous that she should take sustaining, or perhaps stimulating, substances. But these must be forbidden: the process of digestion does not go on under labour with sufficient energy to assimilate solid animal food; and any thing likely to excite the circulation would have a tendency to induce fever. A little beef-tea may be taken; but farinaceous preparations, or tea, or coffee, are much better; and we shall generally find that, inasmuch as the digestive process is almost suspended under labour, so there is very little desire for nourishment; and what is swallowed beyond the simplest fluids, is more in compliance with the entreaties of her officious friends, than from any appetite or inclination of her own.

Duties during the second stage.—The second stage of labour having commenced, we are summoned to the patient's bed-room, if we have been absent, and told that the "waters have broken." She is most likely found reclining on the bed, and probably the pains are more urgent than they were before, or perhaps they are somewhat suspended. We now require to make another examination, because it is possible that the head may have fully entered the cavity, and may be soon expelled. Finding it low in the pelvis—finding the os uteri almost entirely dilated, the membranes broken, and the pains strong, and coming on frequently, it is right not to leave the room; but unless the perineum be somewhat on the stretch, it is not necessary for us yet to take our post exactly by the bed-side.

But as soon as the head has come to press upon the external parts,—particularly when it has made its turn, and is beginning to extend the structures at the outlet of the pelvis,—it becomes our duty to take our seat

by the bed-side, and never to move from our position till the child has passed. This we do to protect the perineum, in order to prevent laceration.

For the purpose of supporting the perineum we sit rather behind the patient, and apply the palm of the left hand—guarded for the sake of delicacy, cleanliness, and convenience, with a soft napkin—steadily and firmly against the perineal tumour.

To give the required protection, it is not necessary that we should make powerful pressure, nor resist the child's exit by the employment of any exertion; we are only to afford a passive support. Placing our elbow on the bedstead, we render it a fixed point, and rather allow the head, covered by the thinned structures, to be protruded against our hand, than forcibly press our hand up against the head. This part of the duty of the obstetrical attendant is sometimes exceedingly fatiguing. We may occasionally be compelled to remain many hours by the side of the bed, without moving from our seat. It is not to be wondered at, that, under such an irksome posture, the hand should become numbed, and the whole body cramped; but we must put our personal inconvenience quite out of the account, when weighed against our patient's safety; and we must recollect that the more rigid the parts are, the longer they take in dilating, the more our assistance is necessary. We must not permit any length of time that we may have so fatiguingly occupied, to rise as an excuse for relaxing in this duty; but always bear in mind, that if the uterus act strongly, and the head be protruded suddenly, while the parts have not the advantage of the support we can afford, there is great danger that such a degree of laceration may occur, as will perhaps render the woman miserable for the rest of her existence.

Most women remain tolerably quiet, in one position, during the second stage of labour; but some are exceedingly irritable, tossing about in all directions, will not be advised, and can scarcely be restrained. It is our duty by all the means in our power, both of persuasion and gentle force, to prevent such a patient injuring herself by suddenly starting away from our protection; for many cases have happened where a rupture of the perineum, under such circumstances, has occurred, to a frightful extent: and, by a little management, we may generally succeed in confining her sufficiently. I have already mentioned, that the thighs must be drawn up towards the abdomen, and the legs bent a little back upon the thighs, the whole person lying on the left side; and the patient is usually placed so that her feet may rest against the bed-post; and in this way they become a fixed point, and keep the pelvis steady. We render the shoulders, also, another fixed point, so as to steady the upper part of the body, by tying a long napkin, or a round towel, to the same bed-post; and desiring her to

hold it in her hand. We tell her, when the pain comes on, to press with her feet against the bed-post; and pull gently at the towel, cautioning her against straining violently. The consequence is, she so fixes her person as to render it almost impossible for her to jump away suddenly, or to recede to any distance from us. Independently of this little manœuvring —when the head is in any degree extending the vulva—the nurse must be required to raise the right knee to some distance from the other, by which means the thighs are separated, and an increased facility given to the exit of the head through the external parts, as well as some control exercised over her movements.

It is very possible that the nurse may wish to substitute a pillow for her own services, and persuade us it will do equally as well. For four reasons the pillow must be objected to; it increases the heat of the person, already, perhaps, profusely perspiring; it does not afford a support sufficient to prevent the legs from being squeezed together; in the acme of pain it will often slip away from between the knees, and we lose its advantage just when we require it the most; and lastly, it can be of no service in restraining the woman in one posture.

The extent of injury to which the perineum is liable varies much in degree, from a simple laceration of one or two fibres at the anterior edge, to a rupture of the whole organ, the destruction of the sphincter ani, and the conversion of the two canals, the vagina and rectum, into one common cavity. The rent generally commences at the fourchette: at other times it will begin in some portion of the inner membrane of the vagina, and extend anteriorly to the edge of the perineum, when it will be again continued back through the integuments to the point corresponding with the origin of the laceration within, or will even pass beyond it; and more rarely the head is protruded through the substance of the perineum itself, forming a fresh aperture, by which it escapes, leaving the fourchette entire. Of this latter variety, I have only seen one instance; and on that case my opinion was requested in consultation, a few days after the labour. It was evident there, that the child had not passed through the vulva, but through an adventitious opening, between the anus and genital fissure, and the attendant was perfectly aware of that circumstance at the time.*

Varying much in time, varying much in the intensity of agony which is suffered, and in the number of pains that occur, the head is at last protruded, in the manner before noticed. It is most likely the child may attempt to gasp the moment the head is expelled; and on this account it is right to wipe its face immediately with a clean napkin, (of

* For a case of this kind see Merriman's Synopsis of Difficult Parturition, p. 240. See also Denman's Introduction to Midwifery, chap. ii. sect. 7.

which necessary articles we always require to have a store close at hand,) lest in the first inspiration some of the mucus which may hang about its lips, or other moisture, should be inhaled.

Coiling of the funis around the neck.—I have already mentioned, that some little time usually elapses between the expulsion of the head and the pain that is to expel the shoulders; and this interval may be usefully employed, after the face is cleaned, in making an examination of the neck, to ascertain whether a fold of funis may not possibly be surrounding it, Plate XXVI. fig. 84. It frequently happens that there is one; sometimes there are two, and occasionally three or four folds of the navel-string coiled around the neck; and if it were not liberated, it is very possible that the pain which expels the shoulders might cause the placenta to be dragged away from its attachment, to the great peril of the mother, from hæmorrhage, or perhaps from inversion of the uterus. But the chief danger is to the infant. If on its expulsion the cord be drawn tightly around its neck, the circulation through the funis will be arrested by the compression of the vessels; and the same compression may also close the trachea to such an extent, as to prevent the ingress of air into the lungs. Thus the two sources by which life is maintained being cut off at the same time, strangulation must be a necessary consequence. I was once witness to the death of an infant under such circumstances. When I arrived at the patient's house, I found the child lying dead near the external parts of the mother. The funis umbilicalis was twice coiled round the neck, and the child had been deprived of the advantage of the placental circulation, and of the power of breathing at the same time, and by the same means. There was a deep livid ring encircling the throat, produced by the pressure the funis had caused; and it was evident from this mark that the infant was alive at the moment of its birth. It is a most interesting and instructive case, not only obstetrically and physiologically, but particularly with respect to forensic medicine. If this birth had taken place under suspicious circumstances, and the mother had not been a married woman, it is very possible that a charge of murder might have been founded on the appearance of the mark round the neck; as it could not be distinguished from the effects of a cord, applied with the intention of destroying life.

The best way to free the funis from this awkward situation is by drawing down the loop, and passing it over the child's head, by which means we liberate it entirely, and it is no longer an impediment to the expulsion of the shoulders. But it occasionally happens,—especially if the funis be more than once coiled round the neck,—that it is not sufficiently long to allow its being pulled over the head: we may then keep the loop distended with our fingers, until the shoulders are expelled, and they must be allowed

to slip through it. In some cases it is not possible to carry into effect either of these modes of liberating the child; and it may be necessary to cut the funis before applying a ligature. Under such a proceeding we must be careful to prevent bleeding from the umbilical arteries.

Directly the head is born, it is usual for some one of the attendants to offer to the medical practitioner a close flannel cap for the infant, which he is expected to apply as soon as a convenient opportunity occurs; and this is done under the idea that, of all parts of the body, the head is most susceptible of the action of cold. As far as I know, there is no good ground for this assumption; but inasmuch as the custom is dictated by a very universal prejudice, it is as well to give way to it, unless other more important duties require immediate attention: for should this very necessary precaution, as it is supposed, be omitted, and the proffered means of protection be rejected with indifference or scorn, it is more than probable that any little ailments the child may be subject to during the first few weeks of its extra-uterine existence, will be attributed to the neglect shown in this particular.

Support of the perineum during the expulsion of the body.—Although the shoulders of the child take up less room than the head, and although the parts, having been previously distended by the passage of the larger substance, generally easily admit the shoulders—provided the child be of normal shape—still it is desirable that support should also be afforded to the perineum while the body is being protruded, even after the head has made its exit. Having wiped the face, and made an examination to ascertain that the funis is not twisted around the neck, we may again place the left hand on the perineum, while we direct the fœtal body rather forwards,—in correspondence with the axis of the pelvic outlet,—and receive it with the right.

It used to be the custom to surround the neck with the thumbs and fingers of both hands, and forcibly extract the body the moment the head was in the world, for the purpose of liberating the woman from pain, and terminating the delivery as speedily as possible. Such practice is attended with double danger;—great chance of injury to the child, by the tension of the neck; and no small probability of hazard to the mother, by the uterus being prematurely emptied. It is thus left in a flaccid state: the stimulus which previously disposed it to contract is suddenly taken away; that disposition ceases, or is suspended; hæmorrhage is induced; a necessity probably arises for the artificial removal of the placenta; and incalculable mischief is the consequence. Those persons who commend such meddling interference, and who estimate the skill of the obstetrical attendant by the rapidity with which he can extract the body after the head is born, found their eulogium on most dangerous premises.

When the shoulders have passed, the parts require no farther protection; the breech and legs are generally soon expelled, with slight suffering, and little hazard to the maternal structures.

The child, then, being entirely in the world, it must be slowly removed a little distance from the mother's body, not more than to the extent of four or five inches, and withdrawn from beneath the bed-clothes, the woman's person being still left perfectly covered and concealed. It has been already shown that the funis umbilicalis varies exceedingly in length, and that sometimes its measure has been known not to exceed half a foot. Now should the cord be unusually short, and should we hastily draw away the infant to some extent, we shall *make a pluck* at the placenta; and we run the risk of tearing it away from its attachment, or, perhaps, of even inverting the uterus. If we find the cord sufficiently long to permit the farther removal of the child's body, we may place it more completely under our command; and after having lifted the bed-clothes from above it, so as to bring its person completely into view, we may proceed to secure the vessels, and separate it from the mother.

The ligatures commonly employed in London consist of eight or ten pieces of thread, a skein of which is placed in readiness for our use. A sufficient number having been selected to form the proper thickness, a knot must be tied at each end; and this preparation should be made before the child is born. Even in forming the ligature some attention is requisite; if it be too thick, it will not compress the arteries sufficiently to prevent bleeding after the funis is cut; and it is also liable to lose its hold, and slip altogether off the cord, thus leaving the vessels perfectly unprotected: and if, on the contrary, it is too thin,—consisting only of two or three threads,—it will probably cut through the membranes covering the cord, as well as the coats of the vessels, themselves, and cause in this manner a loss of blood. It is also necessary that the threads should be all of equal length; for if one or two be shorter than the rest, they alone will make compression; and consequently they will act, as though the ligature were composed of them only.

Two of these ligatures at least must be prepared: one is to be applied about three fingers' breadth—two inches—from the child's navel, must be drawn tight, and strongly secured by a double knot. A second must be placed nearer the placenta, at about the same distance from the first, that the first is from the body of the infant; and a double knot made as before: the funis is then to be divided between them.* It is as well, previously to

* Smellie, (vol. i. p. 196,) Baudelocque, (parag. 848,) and Dewees, (parag. 485,) recommend the employment of one ligature only, near the body of the child; and the reason assigned is, that the escape of blood from the open vessels of that portion of the funis left attached to the placenta, by diminishing the bulk of that mass, facilitates its expulsion. This practice

tying this second ligature, to squeeze as much of the blood as we can out of the space intervening between the two up towards the placenta, lest at the moment the division is made, some should be projected on our dress.

The object of the second ligature is two-fold—cleanliness and safety: if the cord were cut beyond the first ligature, without securing the placental end, the blood contained in the umbilical vein and placental vessels would be squeezed out, and run upon the floor, or on our own clothes. But especially is this addition to be used as a precaution against the possibility of danger: for if the gestation had been double, and if (which is a very rare occurrence) the circulations of the two children anastomosed in the placenta common to both their systems, so that the blood of each circulated in the body of the other reciprocally, it is possible that the unborn child might bleed to death through the divided funis of the one already in the world; provided the end of the cut vessels were left unprotected. We need not fear that the woman would lose any blood from her system through the open vessels of the cord, even although the placenta remained attached to the uterine surface; because there is no direct vascular communication between the uterine arteries and the umbilical vein.

There is danger in placing the first ligature close to the body of the child, lest we should include a portion of intestines protruded through the open umbilicus into the cord—an occurrence by no means rare—and lest the compress should not be tight enough to prevent hæmorrhage, in which case we have no space left to apply another ligature upon; and there is danger also in dividing the funis too near the first made ligature, lest it should slip away from its hold, and the vessels be no longer secured.*

The funis must be divided by a pair of blunt-pointed scissors, to prevent the possibility of the infant being injured by the extremities of the blades. For the purpose of protecting it farther also, the thumb and third finger of the left hand must embrace one portion of the funis,—being placed over the ligature which is nearest to the child's body,—while the other ligature is held between the first and second finger of the same hand; and the section must be made between them by one cut. If one portion of the funis only be held, and that carelessly, while the division is being made, it is by no means impossible that one or more of the child's fingers or toes might be taken off at the same time, as in the case recorded by

rests upon erroneous premises, as the placenta is equally well thrown off, whether its vessels are allowed to bleed or not.

* There was an absurd notion formerly prevalent in relation to the length of that portion of the funis left attached to the child's body on its division, (see Dionis's Midwifery, English translation, p. 298,) which is commented on by Dr. Graaf, (Amstedel: 1705, p. 72,) in the following words:—"Ineptum est illud obstetricum figmentum futurum penem majorem, si vasa umbilicalia non proximè ad umbilicum ligentur."

Merriman;* or the penis even might be amputated, as occurred in an instance that came under Denman's observation, and which he used to detail in his lectures.† It will be impossible for an accident of this disastrous kind to happen, if we protect the child's body as just recommended; for should it throw a limb into the very jaws of the scissors at the moment we are about to close them, we shall feel the stroke upon our hand, and become conscious of the chance of injury.

Generally the infant cries strongly as soon as it is born, and in such case the ligatures may be applied immediately. It was once the custom to tie the funis directly the child was in the world, whether breathing had commenced or not; under such management, no doubt, many were lost. Hippocrates,‡ speaking of a fœtus that has passed with difficulty, or been extracted by art, counsels us not to separate it from the mother until it had either passed urine, sneezed, or cried aloud; or, in other words, until strong assurance was afforded of its having assumed some of the functions belonging to breathing life. Denman§ recommends that we should not put a ligature on the funis until after the circulation through the umbilical vessels has ceased. Of these instructions, that by Hippocrates is by far the best. There is no necessity to wait until the umbilical vessels have ceased to pulsate; because the same changes will take place in the arterial system of the child, whether the circulation in the funis is interrupted rapidly, or whether it occurs more slowly, and by degrees; and the infant can derive no benefit from a continuance of the circulation through the cord after it has breathed freely, nor indeed after the placenta is separated from its uterine attachment. Denman tells us, "in the course of ten or twenty minutes, or sometimes longer," the pulsation in the funis has entirely ceased. I am inclined to think it would generally be much longer; but this is mere speculation, as I have no experience on the subject; for I never delay the application of the ligature until the pulsation has ceased spontaneously. It appears to me, indeed, by such a practice we should be unnecessarily keeping the child in a very awkward, not to say dangerous situation, and subjecting the mother also to considerable additional inconvenience. The rule I would lay down for the guidance of the student is nearly that directed by Hippocrates. I would recommend him not to put the ligature around the funis until the child has cried, or given

* Synopsis of Difficult Parturition, p. 21. Here one joint of the little finger was included in the ligature and cut off.

† See Introduction to Midwifery, chap. viii. sect. 9, where the case is hinted at, though not detailed.

‡ De Superfœtatione, caput 5. I do not quote Hippocrates as an obstetrical authority; but his remark is valuable, as showing the practice of his time.

§ Chap. ix. sect. 9.

some other unequivocal evidence of the proper change having taken place in the function of the lungs; unless indeed it be born with animation suspended, and he is desirous of using the warm bath, inflation of the lungs, and other resuscitating means, as speedily as possible.*

* When the child does not breathe immediately on its birth, it is sometimes difficult to ascertain whether it is actually dead, or its animation is only for a time suspended. Animation may be suspended by many causes: immediate loss of blood, sustained by the mother, as well as pressure on the head, or on the funis umbilicalis, will produce the effect; but it more frequently results from the latter than either of the former causes. This pressure may be the consequence of the funis falling down by the side of the head; or of the gravid uterus, by its action, squeezing it between its own parietes and the fœtal body. Whenever, then, a child does not attempt to breathe soon after it is born, we should endeavour to ascertain whether it is really dead, or whether animation is only suspended for the moment. This may usually be known by placing the hand over the region of the heart; and if there be the least tremulous pulsation observed, it should be taken as an indication that the child may be saved. A newly-born infant is exceedingly tenacious of life, and many children have been recovered, by the use of proper means, who would inevitably have perished under less careful management. Often, too, a state of deep stupor, owing to the compression the brain has suffered during the passage of the head, prevails for a little after birth, which, unless removed, might terminate in death: for, while it lasts, the nervous system is not susceptible of those impressions necessary to induce the first act of breathing life. The child may then frequently be roused by two or three smart slaps on the buttocks, back, and chest: and, on its being awakened from its lethargic state, a sob will be drawn; this will end in a cry, and respiration will be established. This simple expedient will of itself often be found sufficient, without the employment of any other resuscitating measures.

Should this, however, fail to excite the first respiratory effort, provided the heart's action be too feeble to propel the blood through the navel-string,—the separation should be effected as speedily as possible, and the child entirely immersed in a warm bath. Whenever we are attendant upon a case of lingering labour, or one complicated with hæmorrhage, or any other accident after which it is probable that the infant may be born with impaired vitality, it is right that we should have in readiness a small tub, or pan, with a sufficient supply of hot and cold water, that a bath of proper temperature may be made instantly. We shall frequently find that the stimulus of warmth applied to the skin will excite the respiratory organs. The temperature should be ninety-seven or ninety-eight degrees. But if, after a few minutes, the child does not gasp, and we observe that the heart is acting less forcibly than before the bath was had recourse to, its continuance in the warm water will do no harm both negatively and positively;—in a negative manner, because it prevents our calling to our aid other more efficacious means; and positively, because the warmth—when the powers are reduced to a certain point of depression from some particular causes—seems to act injuriously on the nervous system; for it has been proved experimentally, that many animals will drown much quicker in warm than in cold water. If this be granted, it is probable that a corresponding injurious effect may be produced on the body of an infant under the peculiar state of asphyxia we are now considering. The next means to be used, then, is artificial inflation of the lungs; by which we keep up, for a time at least, the heart's action.

A hot flannel, or blanket, must be prepared: the child should be taken out of the bath; the surface rapidly wiped as dry as possible; a bit of clean flannel should be placed over its face; the nostrils may be squeezed together with the thumb and finger; and we should blow into its mouth with our own, alternately inflating the lungs and depressing the chest. The flannel is merely useful for the sake of cleanliness; it is by no means absolutely necessary, but it does no harm, and it is as well that something should be interposed between the child's mouth and

On the child being separated, it must be handed to a careful attendant; and we must be watchful that its mouth and nostrils are not so covered as to impede the ingress of air into its lungs, an accident not unlikely to happen from the too zealous attention of its new protectress to prevent its taking cold.

The infant being carefully disposed of, we must pass our hand upon the patient's abdomen, before we leave our seat, for the purpose of ascertaining whether there be a second child or not; and whether the placenta is still retained within the uterus, or has escaped into the vaginal cavity.

If the uterus contain another fœtus, its fundus will be felt high up,

our own. Some practitioners recommend that we should always be furnished with a tracheal pipe, by which the lungs may be more perfectly inflated than with the mouth alone. The only objection which can be made to the use of a pipe is the difficulty in its introduction through the rima glottidis, and the consequent loss of much important time. It is much more apt to pass into the œsophagus than the trachea, and embarrass the operator; if, however, he has acquired a certain degree of dexterity in its introduction, and can employ it without delay, the lungs are more likely to be efficiently filled by its aid than without it. For myself, I have often restored newly-born children in the more simple manner just recommended; for although some air will certainly pass through the œsophagus and distend the stomach, still a large quantity will also find its way into the lungs; and although the abdomen becomes somewhat tumid, that does not interfere with the proper descent of the diaphragm, nor produce more than momentary inconvenience; and certainly this slight embarrassment to full respiration is not to be put in competition with the chance of restoration that the process of inflation affords.

Provided, however, still the child does not breathe naturally, while the heart continues to act, as is often the case, we may then rub a little spirit on its chest, and back, and shoulders; and we may irritate the glottis also, by letting a drop or two of spirit fall on it from the tip of our finger. This will often produce a convulsive sob, which may be the commencement of the respiratory process. Our efforts must be kept up with perseverance, while there is the least quivering motion perceptible along the cardiac region; for it is proved, beyond a question, that in many animals the heart has been kept in action, by inflation of the lungs, long after death had unequivocally taken place. Thus Le Gallois kept up the heart's action in rabbits for many minutes, and even some hours, after he had taken off the head—the vessels having been previously secured—by alternately inflating and compressing the lungs; and Sir B. Brodie has also shown that in small animals artificial respiration will support the circulation of the blood for some time after the heads of the animals had been cut off. These experiments disprove the assertion of Bichât, which he maintained, apparently on theoretical grounds only, that inflation can never restore circulation that has once ceased; but is effectual only in those instances where the heart still pulsates, but propels mere venous blood. Hence, however unpromising the case may be, it is our duty, whenever there is the least indication of the heart not being completely at rest, to use the most vigorous means for the purpose of restoring its full powers.

It appears to me that this subject has not been regarded by medical men with the attention that it deserves. But a paper will be found in the fifteenth number of the Provincial Medical and Surgical Journal,—a work which, from the acknowledged talent and deep learning of the editors, must prove a valuable addition to the periodical medical literature of the present age,—from the pen of Mr. Toogood, exemplifying the advantage derived from a steady perseverance in inflation, with the sentiments expressed in which I perfectly coincide.

above the umbilicus, and its general bulk will be almost as great as it was before the expulsion of the first. We shall be able to define it distinctly; it will present that peculiar elasticity, and that degree of subdued fluctuation, which are so characteristic of the gravid uterus towards the close of pregnancy. But if there is no other child in the cavity, we may find the womb in one of the following five conditions. First, it may be almost as small and hard as a fœtal head, so that we can grasp its body completely; and it feels nearly as solid as a cricket-ball. Secondly, it may be almost equally small, but softer; so that when we press it, it *gives* under our hand, and has somewhat of a doughy feel. Thirdly, it may be about the same size, but one minute hard and the next soft. Fourthly, it may be almost as large as an adult head, and so hard that we can perfectly define it with the hand; it bears the character of a large, solid tumour. And, fifthly, it may be as large as an adult head, and soft, its general volume not so easily defined, also communicating a doughy sensation to the touch; and when grasped, it becomes harder in substance, and less in bulk.

The first three states announce that the placenta has wholly, or almost wholly, passed into the vaginal cavity, and the two last indicate that it is still in utero; the fourth proves that the uterus is contracted around the mass, and the fifth shows that it has not yet taken on itself the office of contraction, for the purpose of expelling it. Of all these conditions immediately after the child is disposed of, we generally find the last the most prevalent—namely, where the uterus has not yet contracted to expel it; but where we may expect that in a few minutes action will be re-established, under which it will be protruded into the vagina. The woman cannot be considered in a secure state so long as the placenta is retained in the uterus; nor is she to be looked upon as positively safe from hæmorrhage, unless the first of these varieties obtain,—unless the uterus is as small as a fœtal head, and so hard that we can make no impression upon it by our grasp. We may then conclude that the placenta is entirely excluded, and that she is free from the danger of flooding, at any rate for the present: but this state of perfect contraction is seldom met with so soon after the child's birth.

After having examined the uterus through the parietes of the abdomen, we must make an internal examination, more perfectly to assure ourselves in what way the placenta is disposed of. Twisting the funis umbilicalis around the first two fingers of the left hand, and bringing it to its bearing, we pass the first finger of the right hand, previously anointed, into the vagina, as in a common examination. If the placenta be entirely in utero, which, as just remarked, is most commonly the case immediately after the child's expulsion, we shall either not be capable of touching it at all, or if it be within reach, we shall only be able to detect a very small por-

tion of it; we may just feel it offering itself at the os uteri, but we cannot surround its volume, nor can we probably discover the insertion of the funis.

Removal of the placenta.—There is no part of natural labour which requires so much judgment as the conduct of the third stage; for the slightest mismanagement of the placenta may be productive of most serious mischief, by converting a perfectly natural into a most dangerous and complicated case. As long, then, as the placenta remains in utero, so long we must wait, within a certain limit,—provided there be no flooding,—for those contractions which are to expel it from the uterus into the vaginal cavity. The length of time which it is desirable to wait will be particularly specified when the undue retention of this mass is treated of.

Before quitting our post at the patient's bed-side, her person must be made as comfortable as circumstances will permit, by the removal of all the wet and soiled napkins, and the application of two or three others, warm and dry, to the hips and vulva. We need not be solicitous about getting the placenta away soon; all pulling or jerking at the funis with this intent must be avoided; but while it remains out of the reach of the finger, provided there be no return of pain, some gentle grasping pressure may be made on the uterine tumour; this will facilitate contraction, and perhaps expedite the expulsion of the mass. The amount of pressure must not be such as to give pain, but only a comfortable support and a sensation of security. Having withdrawn from the bed-side, and paid some little regard to the arrangement of our own dress, we may offer some words of consolation and congratulation to the patient; make our observations on the pulse; and request another blanket may be thrown over her, to prevent any rigor or chilly feeling supervening on the violent perspiration she has suffered.

In some countries, and in parts of this kingdom, it is the custom to give the patient a tolerably strong stimulant or cordial, consisting of a glass of warm wine or spirit and water, immediately after the child's birth;* but in London this practice is not generally followed; and I think we act more safely in omitting it, unless faintness or some other cause indicates the necessity. Any mucilaginous or diluent drink may be exhibited, if she be inclined to take it—not warmer, however, than the temperature of the body;—and we may assure her, unless there be any contra-indicating system, that so far she is safe for the present.

The nurse should be required to devote herself entirely to her mistress

* Campbell's Mid. p. 198.

until after the placenta has passed, because her services may be necessary; the child need not as yet engage any part of her attention. We may employ ourselves in the patient's room for five or ten minutes, if we choose, or we may withdraw into another; but we must on no account leave the house so long as the after-birth is unexpelled; and we must not be many minutes together absent from her side, lest a sudden attack of hæmorrhage should occur, and only be detected on the supervention of syncope. Our time may be advantageously occupied in looking to the child's safety, and particularly in assuring ourselves of the security of the umbilical vessels.

While we are thus watching, we shall most likely be informed of the return of uterine action, by the woman complaining of two or three comparatively trifling pains affecting the back and loins. As it is probable that under these pains the placenta may have somewhat descended, another examination may then be made *per vaginam* to satisfy ourselves on this point. Our subsequent conduct must be regulated entirely by the situation in which the placenta may be found. I have already said, that so long as the mass remains perfectly out of the reach of the finger, so long it is completely included within the uterus, and so long no attempt must be made to remove it by traction at the funis. But although we may be positive, if we cannot feel it, that it has not yet descended into the vaginal cavity, we cannot be equally certain, when we detect a portion of it, that it is wholly excluded from the uterus; because part of the edge may appear externally to the os uteri, while the great mass remains within. Neither must we feel satisfied that it is lying loose in the vagina, even although we may be able to distinguish the insertion of the funis easily, as is generally taught and believed, because the placenta may be of a battledore formation; Plate XVIII. fig. 64; and although the root of the cord may be quite within reach, and the division of its vessels perfectly and clearly discernible, yet the principal bulk may be still in utero, and perhaps morbidly adherent to the uterine surface; under which state, if we were to make any forcible attempts to remove it by pulling at the cord, we must necessarily and inevitably produce mischief, and should probably place our patient's life in imminent hazard.

Before we can assure ourselves that the placenta is totally excluded from the uterine, and resting in the vaginal cavity, we must be able not only to feel its substance distinctly,—not only clearly to detect the insertion of the cord into its structure, but we must also be able to surround it entirely by the finger, so as to encompass its principal bulk. It may then be withdrawn at pleasure by simple traction at the cord. Should it be found requisite, however, to remove it from the uterus, the agency of

the funis must by no means be relied on; but the hand must be introduced completely within the womb, and it must be extracted in the manner to be hereafter particularly detailed.

By some, indeed, we are recommended not to withdraw the placenta even from the vagina, but to wait for its natural extrusion by the muscular powers of that organ,* under the belief, that its continued residence in the canal will stimulate the uterus to more perfect and complete contraction, and thereby farther the prevention of hæmorrhage. I can neither coincide with this sentiment, nor agree with the practice; because, as already shown, the vagina having been inordinately distended by the head of the child, its fibres will sometimes not recover sufficient tone to contract effectually on the mass for some hours. During this time the patient's mind is kept in a state of great anxiety, inducing perhaps serious distress; since all women are well aware that they cannot be pronounced safe until, at any rate, the after-birth has come away. Again, so far from considering the continuance of the placenta in the vaginal cavity likely to prevent an immoderate loss of blood, I cannot help thinking that its tendency would be exactly the reverse; for, should more blood than is usual be poured out by the uterine vessels, provided the vagina be free and unoccupied, it will escape externally, give an opportunity for the uterus to contract, and its flow will be both evident to the woman's sensations, and perceptible to the attendants, on an inquiry being instituted: sufficient time will, therefore, be afforded for employing means to ensure perfect and permanent contraction of the organ. If, on the contrary, the same disposition existed, while the placenta occupied the vagina, by filling up the cavity it would act as a plug, prevent the escape of blood externally, and cause an accumulation in the uterus: that accumulation will distend the uterine parietes; and, in the same degree as this distention takes place, will the vessels be enlarged, and their apertures opened. They will, therefore, be pouring out their contained blood in a geometrically increasing ratio, in proportion as the volume of the uterus becomes expanded. A greater quantity of blood is thus lost in a shorter space of time, and the effect is consequently the more dangerous. Besides, the blood being pent up within the uterine cavity, there is no external evidence of the danger that is stealing onward; and the patient might possibly flood to death before it was even discovered that bleeding was going on.

No harm can arise from withdrawing the placenta carefully from the vagina by gentle traction at the cord, when it is entirely under the command of the finger, introduced as before recommended; but the greatest

* See Denman, 4to edit. p. 271.

possible hazard may be incurred by attempts to bring it away in the same manner, before the mass can be clearly, distinctly, and perceptibly defined.

The removal of the placenta from the vagina is very easily effected. Twisting the funis umbilicalis two or three times around the first and second finger of the right hand, we draw down in a line tending towards the coccyx, and receive it in the left, placed under the perineum; or we may introduce the two fingers and the thumb of the left into the vagina, embrace the mass between them, squeeze it as we would a sponge, and slowly extract it.

It is not only necessary that we should remove the placenta, but the whole of the membranes also, if possible. Some practitioners are careless about the membranes, their whole attention being directed to getting away the placenta; but unless some management be used, the delicate fœtal invòlucra are often torn—pieces are left in the uterus, giving rise to many evils—the least of which, perhaps, is the alarm likely to be created by a portion being protruded through the external parts in the shape of a thread, or offering itself across the vulva, like a smooth glistening tumour, retaining behind it a quantity of fluid and coagulated blood, some hours after the termination of the labour.

Another distressing evil likely to arise from the same cause, is the accession of violent after-pains, induced by the irritation that the presence of a portion of the membranes occasions; and a third, still more dangerous, is fever of a typhoid type, originating in the absorption of the fluids which are entangled within their folds, and which in time become putrid. All these serious inconveniences may be prevented by a careful removal of the membranes.

To obviate the chance of their being torn, some recommend that, as soon as the placenta has passed through the os externum, it should be twisted round two or three times, in such a manner as to bring them away like a cord.* This is scarcely necessary; all that is required being, that we should draw them forth slowly; or carefully work them out with our fingers, if there be any difficulty in their extraction.

The placenta and membranes being perfectly freed, we require a basin or some other receptacle to deposite them in, which, for the sake of decency, we cover with a cloth, and again apply the hand over the uterine tumour, to ascertain that the organ is still in a contracted state, and that no bleeding is going on into its cavity. Having perfectly satisfied ourselves on this point, we may a second time take away the napkins soiled with the accumulated discharges, and envelop the lower part of

* Campbell's System of Midwifery, p. 202. Dewees' Mid. par. 186.

the patient's person in others that are warm and dry. Three will be sufficient: one must be partially slid under the left hip; another may be placed over and around the right hip; and a third carried between the thighs, directly on the vulva. After the patient has been thus made as comfortable as circumstances admit of, the state of the uterus must be again inquired into, by the hand externally applied, before we withdraw from the chamber; and if no relaxation in its parietes has occurred, no increase in its volume, nor any distention of its cavity,—while, at the same time, there is but little sanguineous discharge externally,—we may pronounce her safe for the present from the chance of hæmorrhage; and, if other symptoms correspond, in as favourable a state as could be hoped for.

After Treatment.—*Medicine.*—It is the custom of some practitioners to give a large dose of laudanum immediately after delivery, to quiet the system, to lull the excitement, to still the after-pains, and to procure sleep.* I hold this practice as a principle to be even more injurious than the exhibition of large doses of stimuli, because, besides acting as a strong stimulus for the moment, opium exerts a powerful narcotic effect afterwards; and by this effect, it must interfere with those proper and indispensable contractions which the uterus is taking on itself. It is true we can relieve the patient from the annoyance of after-pains; but at the same time that we remove the pain, we are incurring danger; we are cramping nature, by depriving her of the only power she possesses for ensuring the woman's continued safety. The same objections, indeed, do not apply to opiates in a small quantity; they are, in minute doses, likely to do good rather than injury, because they may soothe irritability without interfering with the necessary changes going on in the uterine system. If, then, we can give such doses of opium, and repeat them at such intervals, as will just induce a state of gentle quietude, and yet not suspend the uterine contractions, we shall be rendering the best service in our power. It appears to me, that by the exhibition of four, five, or six minims of laudanum, or a corresponding quantity of any other sedative drug, repeated every four or six hours, we shall be most likely to effect this object. The opiate may be added to a saline draught, containing three or four drachms of the liquor ammoniæ acetatis, with a little camphor mixture, or given in any other suitable vehicle.†

* See Blundell's Obstetricy, by Castle, p. 729; Ryan's Manual, 1828, p. 251.

† Medicine of any kind may often not be required after delivery; but in many cases it is useful; and in few can even opium do harm, if exhibited in small quantities, unless there exist a peculiar idiosyncracy of constitution unfavourable to its action. It is as well, then, that

Before the house is left, it is right to make another examination of the uterus, through the parietes of the abdomen, to ascertain that it has not become relaxed since the hand was last applied; the napkins, also, round the hips and on the vulva, must be again inspected, that we may assure ourselves no external hæmorrhage is going on. If, upon this examination, we find that the uterus is still as small, and almost as hard as a fœtal head—if the linen be but little soiled—if not more than two or three coagula, the size of a nut, have passed—we need be under no alarm with regard to the state of the patient; so far as hæmorrhage is concerned, she is safe, most probably, for that labour; at any rate for the present moment. If, on the contrary, we observe a considerable discharge of blood upon the bed, if the uterus be large, soft, and flaccid; or if, on pressure being employed, a coagulum escapes, or a quantity of fluid blood passes, with a gurgling noise, she is then flooding; she must not be left, but will require careful superintendence, probably for many hours.

Presuming, however, that the case is of the more common kind—one in which the uterus is small and contracted, in which there is a slight discharge from the external parts,—the napkins being but partially soaked,—and in which the feelings are comparatively comfortable, we may take our leave, giving instructions to the nurse with regard to her future management, until our next visit; and these instructions should be clear, positive, and definite; for the patient's welfare and comfort so much depend on proper attention being paid her during the next few hours, that nothing should be left to the caprice or prejudice of a nurse. The first injunction to be given is as to the length of time she should be allowed to remain quiet until her linen is changed, and she is removed from her position. If there be neither hæmorrhage nor faintness, she need not lie longer than an hour or an hour and a half from the time the placenta came away. The next must be with regard to the mode of removal. She must not be allowed to get off the bed, either to sit or stand; nor must she of her own accord move hand or foot in the way of exertion; she must have the dress in which she was

something should be ordered;—not simply because it is expected;—not merely because the patient may consider herself neglected if it be omitted, and may attribute any inconvenience she may afterwards suffer to that omission;—but because it tends to keep down excitement, and to induce repose. The old fashioned spermaceti draught used to be a favourite medicine after labour. It was administered under the idea that spermaceti was a specific for inward contusions, and that under labour the neck and mouth of the uterus, and the vagina, were necessarily bruised by the passage of the child. Both the positions, however, on which this practice was founded, are erroneous; neither is spermaceti a specific for inward bruises, nor is it usual for any inward bruising to take place under labour. But spermaceti forms an elegant draught, and is a harmless drug, and there exists no objection that I am aware of to its exhibition.

delivered taken off as quietly as possible; fresh linen placed on her person; and she must be lifted, with the least possible assistance on her part, into the place previously prepared for her.

Bandage.—We must not omit to give directions about a bandage, or *safeguard*, as it is usually called, in the idiom of the puerperal chamber. Most frequently, indeed, the medical man's attention is called to the propriety of its application, either by the nurse or the patient herself, so that it seldom becomes necessary for him to give orders respecting it: for women have an idea that the more tightly their persons are braced after delivery, the more likely are they to preserve the symmetry of their form; and this is a point very near their heart. There are few, indeed, who are careless about possessing a good figure; and so long as this prejudice prevails—while the female breast continues to throb with its present passions and desires—so long nothing will be neglected by them to improve those personal graces with which nature, in her prodigality, has enriched them. Some practitioners adapt the bandage themselves, and apply it immediately after the placenta has been removed. I think it preferable in common cases to leave this duty to the nurse; and that it should not be put on until the body-linen of the patient is shifted. Because, in the first place, it appears to me most desirable that perfect quietness should be preserved until the first changes in the uterus consequent upon labour are effected, that no disturbance may interrupt their progress; and in the second, I cannot help thinking that there is something highly indelicate in its being applied by a man,—much more so, indeed, than any of the duties we are ordinarily called upon to perform under natural labour. It is of most service when next the skin; it must be sufficiently broad to reach from the pubes, almost to the ensiform cartilage, and it cannot be properly adapted unless the abdomen be quite uncovered. In addition, I would remark that the nurse must know very little of her duties, if she cannot draw a properly contrived bandage round the person, and give it the due degree of tightness without incurring danger.

The principal object which the bandage serves is to brace the bowels, and give an artificial support, in lieu of that which they have lost through the laxity of the abdominal muscles: and to prevent the faintness frequently attendant on the sudden removal of a certain degree of pressure. It may to some extent, indeed, stimulate the uterus to more perfect contraction; but if that organ be unnaturally flaccid, it would be wrong to rely on compression by a bandage, to ensure its more powerful action, or prevent its cavity being distended with blood;—in such a case, the only safe means of exerting sufficient external pressure is by the grasp of the hand steadily and, for some time, unremittingly, applied.

The interval that should be allowed to elapse between the present and

our next visit must depend on circumstances;—it should certainly not be deferred beyond twenty-four hours, but it is much better that it should be made within twelve.

There are many points to which our attention must be directed upon our first visit. We must learn whether our patient has been much harassed with pain, and what sleep has been obtained; for sleep, the grand restorer of wearied nature, is especially requisite after labour. It is fortunate if we are informed that she has had two or three refreshing slumbers. We do not expect uninterrupted rest, because she will be disturbed by the after-pains; but if she has not suffered much from this cause of annoyance, and has enjoyed three or four hours' sleep during the first twelve or eighteen hours, we consider it as a good average. Of the nurse we require to learn whether any water has passed from the bladder, (for that is a matter of great consequence;) and what sort of a discharge has issued from the vagina. The sanguineous discharge does not cease as soon as the placenta is expelled, nor ought it to disappear suddenly; but a continual oozing of blood goes on from the uterine vessels, in a greater or less quantity, for some time after delivery. In scientific language, this flow is known by the name of the *lochia;* among women, in general, by that of *discharge;* and by the vulgar it is called *the cleansings.* For some days this discharge continues to possess all the constituent parts of the blood; but it gradually loses the firmer portions and red globules; and before its final departure it becomes of a serous character, possessing a greenish tint; it is then known, in the language of the lying-in room, by the name of the *green waters.* This change in its character and appearance is the result of the continued contraction going on in the uterus. At first, when the uterine parietes are comparatively lax; when the vessels are of large diameter, and their apertures perfectly patulous, all the essentials of the blood are allowed to escape through them; and the discharge is consequently purely sanguineous: but after a time, in proportion as the uterus contracts,—as the vessels are diminished in their calibre,—as the openings through which the blood exudes become smaller,—the fibrin and red globules, by degrees, are prevented escaping, until at last the serum only oozes out, carrying with it the smallest possible quantity of the colouring particles. On any exertion indeed being used, and sometimes merely on the first rising from the bed, the discharge may assume a more florid hue, and be more copious than it had been for some time past: unless, however, this be to a debilitating extent, it is not usually necessary to enjoin any stricter confinement in consequence. If, then, on our first visit, we learn that the bladder has acted freely, although, perhaps, with some trifling pain; that the discharge has been sufficient to have required the removal of four or six napkins,—and that a small coagulum or two has also

passed; we may consider the actions of the pelvic viscera so far to be going on in a healthy manner. We are not to expect that any fæces will have been avoided; it is very rarely that the bowels act within the first twenty-four hours after delivery, unless diarrhœa have existed previously to the accession of labour.

After information on these points is obtained, we may require to place our hand on the abdomen, to ascertain whether the uterus is still contracted, and whether pressure upon it gives pain; and we may, at the same time, learn whether the bandage is properly applied. If it has shifted its position up towards the bosom, as it frequently does, we must desire the nurse again to adapt it. We must, of course, make our observations on the tongue, pulse, and countenance: from the appearance of the latter, we shall gain more information than can be described. If the patient looks pale, haggard, anxious, and weary; if her features are shrunk, something is wrong: if, on the contrary, she is placid,—her countenance resuming its natural expression, even although more than usually pallid; while the pulse is seventy or eighty, the tongue and mouth moist and clean, there is every indication of a favourable issue of the case.

It is not right that we should leave the house, without taking some notice of the infant. We must learn whether it has passed urine and stools; and should the answer not be satisfactory, we must make a personal examination, that we may early detect any malformation which may exist in the rectum or external urinary organs.

We must also direct our attention to the state of the mother's bowels. It is the custom in London to give an aperient draught on the morning of the third day after labour. Castor oil, or a common black draught, will be found as efficacious as any kind of purgative; they both generally operate speedily and satisfactorily, without causing much pain. The dose should be repeated every four or six hours, till the bowels act; for it is highly desirable that evacuations should be obtained during the course of the third day.

A plan of diet must be laid down for some days to come. Nothing should be allowed but tea, toast, or farinaceous food, until the bowels are freely opened; and after the operation of the laxative, on the same day, a little beef-tea, mutton or chicken broth, may be given. Such kind of nourishment is all that is required to sustain the system, under any depression the action of the bowels may have caused.

On the third day, the patient may take for nourishment some solution of animal matter; the next day, or day after, nothing forbidding, she may add to this a light pudding; and in a week she may be allowed a small quantity of solid meat. Stimulants of any kind, unless there be an actual necessity for them, never should be permitted until about the end of a fort-

night, and then a glass of wine and water, or mild malt liquor, may be taken.

The temperature of the room must not be overlooked. Even in the midst of summer, the curtains are often found drawn close around the bed, and a fire in the chamber; and when the finger is laid on the pulse, it is observed to be quickened by the application of external heat, while, at the same time, a profuse perspiration bedews the skin. The curtains should be undrawn, that free ventilation may be permitted, and directions should be given that no larger fire be kept than is required for the purposes of the lying-in room. It is as well to hang a thermemoter constantly in the apartment, that the temperature may be regulated every day. Between 62° and 65° will be found the most suitable warmth, both in winter and summer.

Till the middle of the last century, it used to be the practice to force a woman's system with spices and cordials, immediately after she was delivered; to prevent her enjoying a single breath of fresh air; to put sand-bags under the chink of the door; to nail the windows round with list, and take every possible precaution to oblige her to breathe over and over again the same vitiated atmosphere. A more sure method of exciting fever could scarcely be adopted. In more early times, plasters, fumigations, fomentations, cataplasms, ointments, and oils, mostly composed of stimulating or odoriferous drugs, were applied to the abdomen and vulva, with the view of promoting a free lochial discharge;* and we are told that those women who had the misfortune to be in affluent circumstances, were compelled to submit to the infliction of a sheep's, or, in default of that, a hare's-skin, warm and reeking from the carcass of the animal flayed alive, which was placed round the abdomen, to cherish and protect them.† It is not wonderful that inflammatory, typhoid, miliary, and other fevers, were in those days rife; we can only be astonished that, in any case, nature had power to avert the dangers which such an interference with her laws, and subversion of her intentions, must have created.

These observations, however, refer particularly to the middle ages and

* Mauricean, vol. i. p. 374, 4to. edit.

† Guillemeau. See also Chamberlin's Midwife's Practice, p. 122. Chapman, in his Treatise on Midwifery, p. 259, strongly recommends this to be done *after a hard labour*. He states that "he has for many years had a happy experience of this method." Dionis, p. 361, translation, tells us that Clement applied a fresh sheep's-skin to the Dauphiness of France, after the birth of her first child, "but never afterwards, because it was thought it did more harm than good." Ambrose Parè (Johnson's Translation, folio, p. 557) advises that the after-birth while warm should be laid to the vulva, especially in the winter; and that in summer, the skin of a wether recently killed should be applied over the abdomen and loins for five or six hours. So that such filthy practices seem to have been very generally followed.

succeeding years; for the ancients treated puerperal women as though they had suffered some violent and extensive accident, as we learn from the recommendations inculcated by Celsus.* They were confined for a certain number of days to the sparest diet, and severest regimen. Of the two methods, that advised by Celsus must be regarded, on the whole, as most consonant with reason;—nevertheless, no general plan can be universally applicable, but a deviation from it must in some instances be necessary.

The woman must be kept in the recumbent posture as much as possible, for at least a week. It is better that she should not sit up, even to have the bed arranged, for that time. She may be moved daily from one side of the bed to the other, and lie on each alternately. In this manner she can have the advantage of the change every day. If a bed, however, heats her, or lying on it is very irksome, she may recline for an hour on a sofa, carefully preserving the horizontal posture. The ninth after delivery is looked upon, by women, as a critical day: many consider that, if they have so far escaped the dangers of the puerperal state, when that day is past they are safe from all the perils of their condition: and some think that however much they may have indulged their appetites before, and although they may have been up for some hours for the two or three preceding days, on that they are bound to fast and keep their bed. Although the prejudice of the ninth being a critical day is founded on error, it is as well to favour it; because it is highly desirable that every woman should be kept in a state of perfect rest, and should submit to be treated strictly as an invalid—at any rate, until that period of time has gone by.

After a week, she may get up, and lie the principal part of the day on a sofa. After a fortnight she may begin to put her feet to the ground, and she way take an occasional walk about the room: but the liberty allowed in this respect must depend very much on the continuance of the lochia. So long as the discharge is flowing at all profusely, the necessary changes going on within the pelvis are by no means perfected; but if it has almost ceased at the end of fourteen or eighteen days, we may suppose that the uterus has nearly re-acquired its small unimpregnated size, and that the parts are pretty well restored to their original tone.

We are expected, in this country, to give our attention both to the mother and her infant during the whole puerperal month; or at least until she has quitted her chamber: it is necessary that a visit should be made daily, until the end of a week; after which time, the attendance may be regulated according to the circumstances of each case. At every visit

* Lib. vii. cap. 29.

the state of the bowels must be particularly inquired into, and care must be taken that they act sufficiently. They are usually torpid while the woman is inactive, and it is requisite to repeat the aperient draught, or administer and enema occasionally. The bandage should be tightened, and the vulva sponged daily with warm water, to which a little spirit may be added. After three or four weeks, cold water may be substituted, and the parts may be liberally sluiced with it; especially if the time of year be summer.

Suckling.—It is not generally that we are asked the question whether a woman should suckle her child or not; or are called upon to interfere. If the patient be well, and she does not mean to suckle, she will not consult her medical man about it, because she knows his advice will go exactly contrary to her intentions: but if she be ill, and cannot, it is then our part to prevent her continuing her fruitless efforts, and to require that a wet nurse should be procured for the child.* Some women are averse from suckling, because of the trouble and confinement it necessarily occasions; but others, on the contrary, regard it as the most grateful and pleasing office they can perform. No one will deny that it is the bounden duty of every woman,—provided she has health and strength, and means,—to nurse her own child, in whatever station of life she may he placed. She should forego the pleasures of society, give up the necessity of appearing in public, and waive the etiquette even of a court, if those pleasures, or that etiquette, interfere in any material degree with her duties to her infant. I cannot allow that a physician would be honestly and conscientiously fulfilling the trust reposed in him, who did not, even in the highest grade of society, point out the dangers that may spring from this most natural and engaging employment being abandoned; and I should always think better of that woman's feelings, both towards her husband and her infant, who gave it the advantage of her own breast.

No doubt it is much both to the mother's and child's happiness, comfort, and health, for the process of suckling to go on. Every thinking person will agree that milk, being the nourishment afforded by nature, is much more congenial to the child's wants than any extraneous food; that it is most likely to afford suitable sustenance, and preserve the system in a healthy state. Nor is the function of lactation, indeed, less beneficial to

* The time when the infant should be first put to the mother's breast must vary considerably in different cases. If there has been a copious secretion from the mammary glands during the last few weeks of gestation, as sometimes happens, the child should be applied early, as soon indeed as the woman's strength is at all recruited, for it will bring her great relief: but if the breasts are flaccid and empty, a longer time must be allowed to elapse. Generally it is both safe and advantageous for the child to suck within twelve hours.

the mother than her infant, although its benefits to her may not be so immediately apparent: for, putting out of the question the more obvious ill effects that flow from suppressed secretion,—such as inflammation of the glands of the breast, and consequent suppuration,—many less evident evils arise, among which may be enumerated congestion of the abdominal and pelvic viscera, and undue determination to the head,—the consequence of that blood which ought to be drained away from the general system by the breast, for the formation of milk, being suddenly thrown into other channels, and upon other organs:—so that, independently of the strong natural inclination which would prompt every woman to suckle, the child's safety and her own health should also stimulate her to undertake the gratifying and important office of a nurse.

One of the most frequent causes inducing a woman to decline giving her child the breast, is the existence of sore nipples; and it certainly appears cruel to insist on a continuance of what produces so much pain. But we have means to defend the tender organ; and we can cure the ulceration: and this in itself is seldom of sufficient importance to justify our allowing a mother to put her child away.

Sometimes, however, we find,—especially among the poorer classes,—that women will suckle longer than is desirable for their own strength, and for the health of their infants, under the belief that they are not susceptible of pregnancy so long as the least secretion of milk is kept up by the lacteal glands. To a certain extent this idea is correct; women are undoubtedly not so likely to become pregnant while nursing, as after the cessation of that function, provided they continue to suckle for the period only that nature intended: but if they exceed the just limit, keeping the child at the breast affords them little or no protection. Thus among the lower orders it is not very uncommon to see a woman suckling her last infant till within three or four months of her next confinement, much to the destruction of her health, and the undermining of her bodily powers. We mostly observe, indeed, that the milk in twelve or fourteen months after delivery decreases in quantity, and becomes deteriorated in quality; and the child now evidently requires other nourishment than what the breast affords. Some line, then, must be drawn at which the infant should be weaned; and perhaps, as a general principle, twelve or thirteen months will be found the most fitting time; for then its digestive apparatus will easily assimilate both farinaceous nourishment, and different preparations of animal matter.

IRREGULARITIES OF HEAD PRESENTATION.

Notwithstanding that according to the arrangement which I have chosen, all varieties of head presentation are considered natural; still, as some are of infrequent occurrence, they may be regarded as *irregularities;* and under that term I shall proceed to describe them.

VERTEX PRESENTATION, WITH THE FACE BEHIND EITHER GROIN.—When the fœtal cranium enters the pelvis with the face situated behind either of the groins, Plate XXIII. fig. 77, and Pl. XXIV. fig. 78, it must be evident, as I have before remarked, that the head is by no means so well adapted to the cavity, as when the face is directed to the ilium, Plate XXII. figs. 73, 74, or looks diagonally backwards to one of the sacro-iliac symphyses, Plate XXIII. figs. 75, 76; and this want of accommodation often induces a lingering labour, and sometimes obliges us to have recourse to instrumental aid.

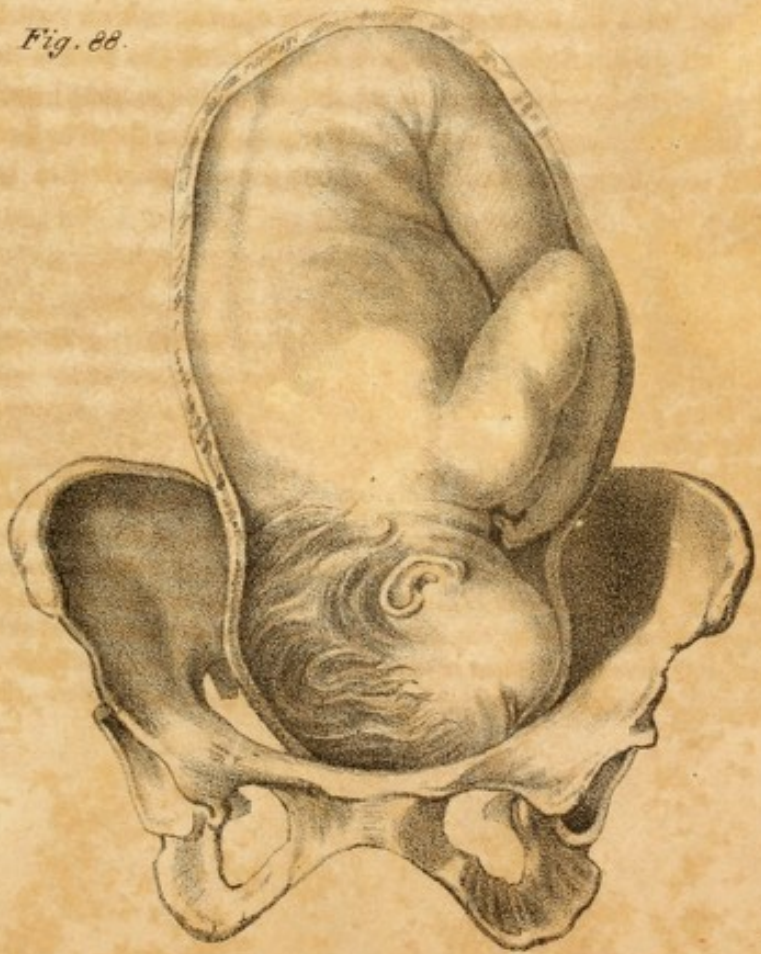
But although a tedious case may be anticipated under this malposition; although the sufferings may be greater, and the time of duration more protracted than is usual;—the mere irregularity of situation is not of itself sufficient to warrant us in terminating the case by artificial means. We are not to interfere instrumentally because the face is placed anteriorly; but we must wait till some circumstances appear which call imperatively for relief and assistance. It matters not whether the face is looking backwards or forwards,—to one side or the other,—provided such symptoms arise as indicate danger, it is our duty not to allow them to become aggravated, but to deliver the patient by those means which are least likely to do injury.*

* The mechanism of the head's passage under this presentation will be found at page 108. When the face turns forwards on the expulsion of the head, the body passes with the back of the shoulders sweeping the hollow of the sacrum, Plate XXVIII. fig. 87. They then turn a little sideways; and the centre of the abdomen appears under one of the rami of the pubes, instead of being directed backwards as in the more ordinary cases. Professor Naegelè is of opinion that, when the vertex presents, the anterior fontanelle looks towards the left groin much oftener than is generally supposed; indeed, that this is by far the most frequent position, next to that in which it is directed to the right sacro-iliac symphysis: and he says *he is thoroughly convinced*, when the face looks diagonally forwards at the commencement of labour, that not the occiput, but the face, is generally turned into the hollow of the sacrum; and that "this change in position requires no peculiarly favourable circumstances; but that these species of labours can be completed by the natural powers under the most usual proportions, in the same time, with the same expense of strength, and without greater difficulty, than when the head takes the most common position." He states, also, that out of ninety-six cases in which

Fig. 87.



Fig. 88.



Sinclair's Lith.

Mode of detection.—It is not very probable that this malposition will be distinguished before the membranes break; because, as the vertex presents, the posterior fontanelle will first offer itself to the finger, and it will be difficult to detect the course which the different sutures take thus early in the labour. Besides which, I have already advised when we have positively satisfied ourselves the head is the presenting part, that we should not endeavour to gain farther information respecting its precise position while the membranous cyst remains entire; partly because of the difficulty of doing so, but principally because of the danger of inadvertently evacuating the liquor amnii prematurely. After the second stage, however, has commenced, when the expulsive pains are well established, we shall probably find that the head does not descend with its usual ease and regularity; and on making as accurate an examination as we can, to ascertain the cause of the delay, we shall detect the posterior fontanelle at the back part of the pelvis, against one or other of the sacro-iliac junctions, and we shall be able to trace the sagittal suture running upwards and forwards, to terminate in the large diamond-shaped, open space—the anterior fontanelle—situated behind the opposite groin, as would be the case in Plate XXIII. fig. 77, and Pl. XXIV. fig. 78.

Being assured that the head occupies this situation, I would strongly enforce the recommendation not to interfere early in the labour, but to wait in the hope and expectation, either that it will be expelled in the manner described at page 108; or that the face will be gradually turned backwards into the hollow of the sacrum, and eventually make its exit, sweeping the perineum. Presuming, however, that after a number of tolerably strong expulsive pains, no advance takes place in the situation of the head, it will then be proper to embrace the cranium between the first three fingers and the thumb of one or other hand, and to give the face an inclination to the right or left ilium, according as its original direction was to the right or left groin: and this attempt must be made in the absence of uterine contraction, and before the head has become locked in the pelvic cavity; for if it be delayed till a state of impaction has occurred, the malposition cannot be remedied by the power of the hand alone, and instru-

the face presented towards the left groin, (which he observed with particular care, and described in his note book,) in three instances only the head cleared the passages with the face directed anteriorly; and in all these three cases there were some peculiarities in the structure of the head or of the pelvis, to which he seems to attribute the forward inclination of the face.—(Rigby's translation, page 45.) I am willing to acknowledge that in many instances the head will follow this three-quarter turn of the half pelvis, when the face has originally presented obliquely forwards; but according to the commonly received opinions, and also to my experience, Naegelè has overrated the frequency, as well of this presentation as of the mode of the head's passage, when it does occur.

ments will most likely be required in order to finish the delivery. In making this change in the position of the head, it would not be right to turn the face at once into the hollow of the sacrum, even if that could be accomplished; because the probability is, that the child's body, being held tight within the contracted uterus, would not follow the sweep which the head describes; and we should incur great danger of injuring the neck. All that we are required to do, is to incline the face to one of the ilia, and leave the rest of the process to nature.

Face directed to the promontory of the sacrum, or the symphysis pubis.—It is very rarely that the head offers itself, at the commencement of labour, above the brim of the pelvis, with the brow directed either against the promontory of the sacrum, Plate XXIV. fig. 79, or the symphysis pubis, Plate XXIV. fig. 80; so rarely, indeed, that some practitioners of great respectability have denied the possibility of such an occurrence.* From my own observation, however, I am perfectly satisfied that both these presentations occasionally do take place. Under this position the head is placed with its longest diameter in the direction of the shortest diameter of the pelvic brim; and if the head and the pelvis be of average dimensions, it is impossible for the head to occupy the cavity, unless a change in situation either occur spontaneously, or be effected artificially.

Diagnosis.—In this case the vertex is observed to lie quite above the brim of the pelvis, almost out of the reach of the finger as introduced in a common examination. But although, from the difficulty in feeling the presenting part, suspicion may be excited that the position is irregular, the peculiar nature of that irregularity will probably not be determined until after the membranous cyst has given away. On the sceond stage of labour, however, having commenced,—following the general direction before laid down,—it is right that an accurate examination of the head, and of its bearings in relation to the pelvis, be made, and we shall find the sagittal suture running from before directly backwards, and not laterally or diagonally. We may then be assured that the face is looking either towards the promontory of the sacrum or symphysis pubis, and positive knowledge on that point will be afforded by the situation of the anterior fontanelle. In relation as this fontanelle is directed backwards or forwards, so will the face be situated.

I have no doubt that this malposition is in many instances rectified by nature herself; that (the force of the uterine contractions being resisted, by the approximation of the pelvic bones in their conjugate diameter, which do not afford due and proportionate space for the descent of the head thus placed) the mechanical impediment offered occasions a turn,

* See p. 108.

with the face to one or other side, on the same principles that regulate the turn which is observed to occur in all natural cases, just before the head escapes externally. There is no more difficulty in believing that such a change of position is likely to happen at the upper than at the lower pelvic aperture.

Being satisfied, then, of the situation of the head after the membranes have broken, having watched the effect of two or three pains, and observing that it evinces no disposition to accommodate itself to the dimensions of the pelvic brim, it is proper,—lest the woman become worn out by inefficient struggles, and lest the cranium become wedged in this unfortunate position,—to follow nature's dictates, and incline the face laterally. This alteration in situation it would not be difficult to effect, by grasping the head between the first three fingers and thumb introduced into the vagina, provided the os uteri were well dilated, the vagina and perineum sufficiently relaxed, and the head remained above the brim, perfectly moveable, free, and unimpacted. On this slight alteration being made, the head will enter the pelvis, all the difficulty will be over, and the case will be reduced to one of the most ordinary character. If, however, we cannot accomplish this object, let us then be guided by the general rule—to which there is no exception—that of waiting till either the lapse of time, or symptoms of danger, require instrumental interference.

Brow Presentation.—Other parts of the head besides the vertex may present. The anterior fontanelle, or brow, may be the depending part; and under this presentation the face may offer itself at the pelvic brim, looking to one ilium or the other—obliquely backwards to either sacro-iliac synchondrosis—obliquely forwards to either of the groins—directly forwards to the symphysis pubis—or directly backwards towards the promontory of the sacrum; in the same manner, indeed, so far as regards the points of the pelvic parietes, as though the vertex presented.

Under either of these malpositions the head is still less adapted to the passage than when the vertex presents with the face forwards, since much greater space is required for its transmission. It has been shown in Plate V. fig. 19, that the same cranium, when the brow or face is directed first, requires a space of nearly an inch more in the longest diameter, than when the vertex is protruded.

Brow presentation; the face looking diagonally backwards.—In all cases where the anterior fontanelle offers itself originally, there is a natural inclination for the case to be converted into a perfect face presentation; and this is owing to the fibres of the fundus uteri exerting themselves strongly upon the fœtal body; under which action the shoulders are pressed down-

wards, the chin is gradually separated more and more from the chest, and the head is expelled in the manner hereafter to be described. If Plate XXVIII. fig. 88, which represents a presentation of the brow, with the chin to the left sacro-iliac synchondrosis, be compared with Plate XXIX. fig. 89, in which is depicted a face case with the chin to the left ilium, it will be easily seen how the power of the uterine contractions tends to convert a brow into a complete face presentation.

It is very probable that the presentation of the anterior fontanelle may be detected before the membranes rupture, because of the large space it offers to the finger: but even should this information be obtained thus early, little can be done towards rectifying the position until the liquor amnii is spontaneously evacuated; since, under any attempts we might use, we should almost unavoidably destroy the integrity of the membranous cyst, which it is of such essential importance to preserve whole. It is necessary that the case should be watched carefully and narrowly; and that, on the rupture of the bag, an accurate examination should be instituted, with the view of determining whether the face lie forward, backward, or laterally. In the case now under consideration, the sagittal suture, which becomes our guide, is traced from the anterior fontanelle running obliquely forwards and upwards to one groin or the other. There can then exist no doubt, first, that the anterior fontanelle presents; and, secondly, that the face is placed backwards in relation to the pelvis.

Inasmuch as a considerably greater space is required under a presentation of the brow than when the vertex depends; inasmuch as there exists such a disposition to convert the case into a face presentation; and inasmuch as the labour is usually protracted, and attended with a proportionably increased degree of pain; it would naturally follow that we should endeavour to place the head in a more favourable position, by throwing the chin more upon the chest, and causing the vertex to descend; provided this could be accomplished without incurring danger, without any aggravation of suffering, and without the formidable appearance of preparing for an operation. This object can frequently be gained, if the position be detected soon after the rupture of the membranes, and before the head has perfectly engaged in the pelvic cavity, by a very simple and easy method; it only requires that steady pressure should be made upon the brow with the extremity of the finger during the urgency of pain, so that the forehead may be arrested at the spot to which it has attained, and the powers of the uterus be expended upon the back part of the head. It is then usually observed that the head is bent forward on the neck, as on a hinge; the vertex comes down, the brow remains stationary; and thus the case may be made one of the most simple, natural, and easy. We can only

Fig. 89.

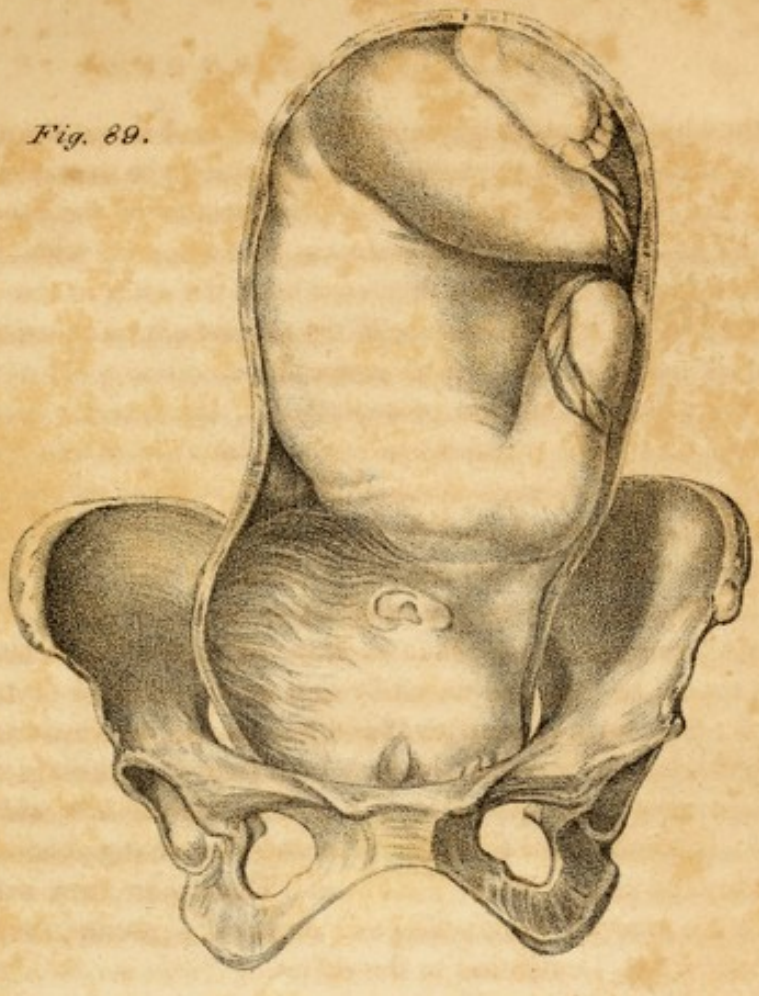


Fig. 90.



Sinclair's, Lith.

succeed, however, in this endeavour during the paroxysm of pain: we are not to expect that we shall be able to *push* the anterior fontanelle *up above* the brim; our only intention should be to prevent it passing *down farther*, and to give an opportunity for the back part of the head to occupy the pelvis more completely. This counter-pressure, nevertheless, must be made with caution, tenderness, and judgment.

Brow presentation, with the face forwards.—The anterior fontanelle may present with the face looking forwards to one or other groin; and this position is even more unfavourable than either of those just described; because not only is that part of the head presenting, which in itself requires a considerably increased space, but it is placed in a most awkward situation as regards the pelvis. There is the double disadvantage of a brow presentation, and the face being directed forwards. There can be but little difficulty in detecting this position, at any rate, after, or even previously to, the rupture of the membranes: the anterior fontanelle is easily discriminated, and the sagittal suture can be traced running obliquely backwards and upwards, until it terminates at the superior angle of the occipital bone, in the direction of one of the sacro-iliac symphyses.

The same remarks just made respecting the propriety and necessity of giving a new inclination to the head, apply with equal truth, and even more force, to the variety now under contemplation. There is the same chance of the case being converted into a face presentation,—the same likelihood of a protracted termination; and we possess almost an equally easy and effectual method of rectifying the unfortunate position. Counter-pressure, during the time of pain, will here also avail us much; not, however, directed on the centre of the brow, but on one side, just above the temple. We may often succeed in preventing the chin passing downwards, in making the vertex the most depending part, and in throwing the face a little backwards. If we can cause the head to move in the slightest degree so as to direct the forehead opposite the iliac fossa, we shall find that nature will eventually turn it with the face into the hollow of the sacrum. Should these attempts, however, not prove successful, the head may be embraced between three fingers and a thumb, and a rotatory inclination given to it: the proper change can thus generally be effected, unless indeed some time has elapsed since the membranes broke.

The presentation of the brow with the face directed towards the promontory of the sacrum or symphysis pubis, is even more unusual than the same direction of the face, the vertex presenting; there will be equal or even more difficulty in its passage through the brim; the same means must be taken to detect its situation, and the same attempts used to place it in a more favourable one.

Face Presentation.—I am inclined to think that most of the face presentations which we meet with in practice were originally brow presentations, and have been changed by the action of the uterus in the way I have already specified: however, there is no question that the face sometimes offers itself even at the very onset of labour. Various are the positions in which a fœtus, when the face presents, may be placed; but this is the most common. The crown of the head is directed to one ilium; the chest towards the other, and a shoulder towards the sacrum and pubes respectively. Plate XXIX. fig. 89. As the case progresses, the face descends down into the pelvis, until the summit of the head impinges on one ischium; and the chin on the other. The direction of the head is then totally altered; the chin appears under the arch of the pubes, and the occiput sweeps the perineum. Plate XXIX. fig. 90. This change, I believe, always takes place; at least I never knew an instance of face presentation, in which the head was expelled with the upper and back part emerging from under the pubic arch. This case requires even more room than any yet discussed; and if it be a first child, it is generally attended with great difficulty and distress: but if the parts be well relaxed —if the pelvis be good, and the pains strong—as a general principle, face presentations will be terminated with little or no assistance.

Mode of detection.—It is not very difficult to detect a face presentation, even before the membranes break; or rather it is easy to determine that no part of the cranium, properly so called, presents; for the face is readily distinguished from the harder parts of the head. On making an examination, an irregular soft body meets the finger, which indeed, unless we are careful in our inquiry, we may possibly mistake for other parts of the child. The face has not unfrequently been confounded with the breech—of which I have known more than one instance; the cheeks have been taken for the nates, and the mouth for the anus. The prominence and regularity of the features will necessarily be our discriminating marks. Thus we may feel the nose about the centre; the two eyes above; the chin below, and the mouth, differing from the anus in shape, size, and in possessing lips;—the gums and the tongue can often be felt also after the liquor amnii is discharged; and then doubt can exist no longer. Besides these sufficiently striking features which indicate the face, the breech possesses certain distinctive marks of its own, to be hereafter particularly noted. If we are satisfied with simply placing our finger against the puffy cheek, we are very likely to fall into error; but we are not to form an opinion by one part alone—we must take all the points that we can reach as diagnostic marks.

It becomes a most important question, whether under a face presenta-

tion any means should be adopted to place the child in a more favourable position. So difficult, and almost impossible, was the transmission of the head under this presentation (as well as some other of these irregularities) at one time thought,* that it was recommended that the hand should be introduced into the uterus—that the feet should be laid hold of, and that the child should be delivered by *turning*. This operation, performed under the most favourable circumstances, is always attended with great pain, and frequently with great danger—danger both to the mother and the child;—to the mother, from the chance of injury to which her structures (particularly the uterus) are exposed—to the child, in consequence of the pressure which the funis umbilicalis must more or less experience, when the head is passing through the pelvic cavity. All these circumstances, then, being taken into consideration, the practice of changing the position of the child under a face impression, by *turning*, is now almost entirely exploded; and we rather leave the case to nature, so long as we can safely trust her, than subject the woman and the infant to such dangers.

But suppose, on watching the case, we find no advantage gained—no alteration in the position of the head—no advance from hour to hour—what then is to be done? We must here also act upon the same unerring principles before laid down, wait till symptoms require our interference, and then use that instrument which seems most applicable to the emergency. For it is impossible, by any counter pressure, to make a beneficial change in the situation of the head under a face presentation. We cannot cause the head to turn upon the neck, so as to approximate the chin to the chest, by pressure applied by the finger; nor can we, indeed, succeed in producing the same alteration by the introduction of the hand over the vertex, the adaptation of the points of the fingers to the occiput, and the application of gentle traction: as some have recommended.† The vectis, then—provided any instrument be required—will be found the most appropriate. Face and ear presentations, indeed, appear to me the only cases in which the forceps does not possess an absolute superiority over the vectis.

The features of a child born under a face presentation are generally much swollen, turgid, and livid. We must be prepared, therefore, to expect some disfigurement; which, however, will generally disappear in a day or two.

* See Dewees' Mid. par. 654.

† Baudelocque, par. 1337, advises this method of rectifying the position, before the head has engaged in the pelvic aperture. See also par. 1870.

Ear Presentation.—Ear presentations are by far the most rare of any of these irregular positions of the head. Either side of the head may present; the face may look to one ilium or the other, or to the pubes or the sacrum.

As illustrative of the mechanism of ear presentation, I will suppose a case in which the face is looking backwards; in which the summit of the head is directed to the right ilium, and the left shoulder impinges on the left ilium; and in which the ear meets the finger, immediately on being passed up to the pelvic brim. Plate XXX. fig. 91. In this position, provided the head clears the brim, it is usually propelled into the pelvis in proportion as the trunk of the child advances, until it comes to press low down upon the outlet; but in consequence of its being doubled sideways on the shoulder, the space required for its exit thus is more than the inferior pelvic aperture affords, and before it can escape it must take a fresh direction: a change in situation, therefore, is effected;—not, indeed, a semi-rotatory turn, such as the head describes under the presentation of the vertex, but the summit of the head passes downwards, moving on the joints of the neck as on a hinge; the face is by degrees thrown into the hollow of the sacrum; and the occiput is turned up under the arch of the pubes. If the face is looking forwards above the symphysis pubis, the case will be surrounded by increased difficulties; but, upon the whole, the remarks just made are generally applicable to all ear presentations.

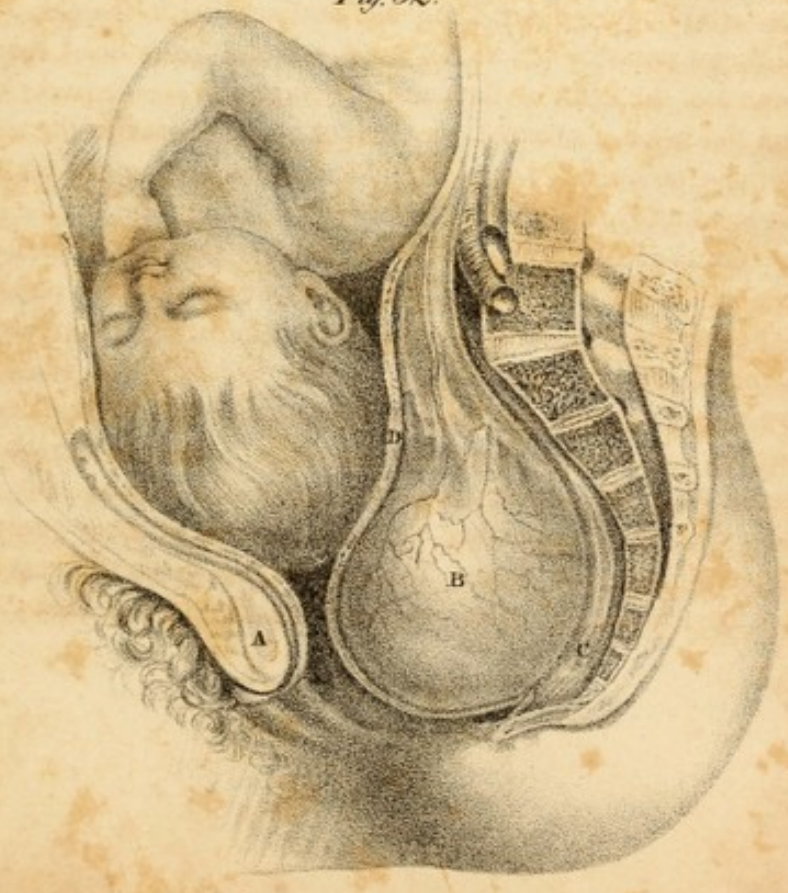
Mode of detection.—There can be little difficulty in detecting an ear, or in determining how the head lies, when we touch it. There is no part of the fœtal body we are likely to confound with the ear. We can feel the different parts of the organ itself, and the bony head surrounding it. We can feel the helix or flap, and the tragus or sessile part; we know that behind the helix is situated the occiput, and anterior to the tragus, the face; and these points will immediately lead us to distinguish the true position of the head as regards the pelvis.

Having, then, detected the ear, and ascertained the situation of the head, three modes of proceeding offer themselves for our choice. We may either turn the child and extract it by the feet; or we may endeavour to bring down the vertex; or, leaving the case for some time to nature, we may hope that the head will gradually assume a more favourable direction. Doubtless there are particular cases to which each of these means may be applicable; but, upon the whole, the observations I have just made regarding the management of face presentations are equally valid in this case. Turning is not generally required, and should not be thought of after the membranes have broken; no good

Fig. 91.



Fig. 92.



Sinclair's Lith.

can be effected by counter-pressure; I cannot see what advantage could be gained by the introduction of the fingers over that side of the head which lies uppermost, even if they could be passed up without difficulty; and it is certainly not necessary to interfere instrumentally, merely because the ear presents. The common principle must here direct us; we must wait patiently, in the hope that nature will effect her object; and should the head remain stationary for some time, or should constitutional symptoms of distress supervene, delivery must be effected instrumentally; and that may probably be accomplished by the vectis.

DIFFICULT LABOUR.

The second class of labours, DIFFICULT OR LABORIOUS, embraces two orders, *lingering* and *instrumental.*

ORDER I.—LINGERING LABOUR.

Plates XXX., XXXI., XXXII.

I have defined a *lingering labour* to be a case in which the head presents; which occupies more than twenty-four hours from its commencement to its termination; which is concluded without the necessity for instrumental or manual interference; during the progress of which no dangerous or unusual symptoms manifest themselves; and in which nothing calling for anxiety occurs, except the length of time that elapses under its continuance: so that it differs only from a natural labour in respect of its duration.

We sometimes hear of a woman being in uninterrupted labour a week, ten days, a fortnight, or even longer. Such an idea is perfectly absurd: the powers of the system could not bear up against the exertion of labour for so protracted a period. Besides which, the active agents could not support their operations for so long a time: for the uterus, whether it is muscular in structure or not, obeys the laws of muscular action under parturition; its powers become gradually enfeebled, under a continuance of excessive toil, and it is at last entirely disabled through exhaustion: with the cessation of its action, the process of labour is also at a stand. This is exactly analogous to what we observe daily and hourly in the truly muscular structures: when fatigued, they contract feebly and unwillingly, and when their powers are exhausted they can exert themselves

no longer. Such cases, then, of reputed prolonged parturition, are dependent on false, irritable, spasmodic pains, situated in some other part of the body; by which, as we have already learned, women are frequently harassed towards the close of gestation; but which are perfectly unconnected with, and independent of, contraction in the uterine fibres.

In estimating lingering labours, we calculate from the first commencement of true uterine action; but in estimating the length of labour, in reference to the patient's strength, and its effects on her system, we principally take into consideration the time that has elapsed since the membranes broke; for it is reasonable to infer that no great exertion has been sustained—consequently that little or no exhaustion has appeared; and particularly, that scarce any injurious pressure can have taken place on the soft parts within the pelvis, while the membranous cyst remained entire; provided there be an ordinary quantity of liquor amnii. Thus, when called to a case of lingering labour, in considering the chance of injury from its duration, our mind should be directed, not so much to the interval which has elapsed since the first accession of uterine pains, as to the time at which the membranes ruptured; and that should be looked upon as the period when it was possible for dangerous pressure to have commenced.

Causes.—Many and various are the causes which may produce a lingering labour. They may be arranged under two distinct heads—those which are referable to the mother, and those in which the ovum is at fault.

The causes referable to the mother are—

First, the want of sufficient power, or the absence of sufficient energy, in the uterus itself;

Secondly, the want of sufficient room in the bony pelvis, to admit the ready passage of the fœtus;

Thirdly, the presence of one or more tumours in the pelvic cavity;

Fourthly, rigidity of the os uteri, vagina, and perineum—one of these organs being affected singly; or a combined rigidity of the whole tending to retard the progress;

Fifthly, a cicatrix, or membranous impediment, existing in the vagina; and,

Sixthly, obliquity of the os uteri.

Those causes of lingering labour referable to the ovum are said to be—

First, preternatural toughness of the membranes;

Secondly, the head being larger than common, from natural healthy formation, deformity, or disease;

Thirdly, the head being too strongly ossified, though not of larger dimensions than ordinary;

Fourthly, malposition of the head;

Fifthly, ascites or tympanites of the fœtal abdomen;

Sixthly, the umbilical cord being unnaturally short, or being twisted around the body or limbs of the fœtus;

Seventhly, unusual bulk of the trunk or limbs; and,

Eighthly, monstrosity.

Some of these causes in which the child is at fault, exert a great influence over the duration of labour; while others possess no power whatever in retarding the process, as far as the head is concerned.

I. Causes referable to the Mother.

1*st. Inefficient uterine action.*—Labours rendered tedious, or lingering, from this cause, are generally observed in constitutions debilitated by previous disease, by excessive discharges, or some other depressing action. We often remark, also, that the uterus acts feebly when the woman has previously borne a large family. In this latter instance, indeed, the organ does not obey the laws of muscular action; for the more frequently muscles are called into powerful contraction, the stronger they become;—the uterus, on the contrary, usually displays less energy when its peculiar powers have been often exerted in child-birth.

This cause of lingering labour is known by the pains being weak; the intervals at which they succeed each other, distant; the space of time during which they continue, short;—while, at the same time there probably exists a good pelvis, and a sufficient degree of dilatation and laxity of the passages to allow the escape of the fœtus, provided the propelling powers were adequate to the end. In some cases, where the delay is attributable to inefficient uterine power, the sanguiferous system may also be acting with diminished force; and there are perhaps other symptoms present, indicative of general debility. It is not likely that we shall find much difficulty in detecting this cause of lingering labour.

Treatment.—Under these circumstances, it becomes our duty to endeavour, if possible, to rouse the uterine energies; by doing which we may probably prevent the necessity for instrumental delivery. This object we can sometimes easily effect. The pains may be augmented both in frequency and strength, and may even occasionally be restored after they have been suspended for many hours;—by warm diluent drinks;—by stimulants taken into the stomach;—by particular medicines;—by friction and other external means;—and by a change of posture.

Of all the methods employed for the purpose of increasing inefficient,

and restoring declining pains, none are more frequently had recourse to, and none are less injurious, than warm diluents; they are the simplest that can be used, and are often successful. It is very common for the nurse, when the uterine contractions are weak, short, irregular and distant, to propose that some gruel or tea should be given "to bring back the pains." If such nourishment be grateful to the patient, if there be no tendency to vomit, or if she feels to desire it, there can in few cases be any objection to the exhibition of warm diluents; and they may be given almost *ad libitum*. To stimulants, as a general principle, under labour, I am decidedly adverse; and consider it as a maxim never to allow them, unless some degree of faintness be present; or a languid state of the general system indicate their propriety: because the excitement they cause must be followed by a corresponding depression; and they may tend either to induce fever, or hurry on exhaustion. Before stimulants are exhibited, many things must be taken into consideration; such as the state of the pulse and skin; the length of time the labour has lasted; the strength of the pains; the degree of faintness the patient is suffering; and the kind of discharge. Should the pulse be weak and slow, the surface colder than natural, the uterine contractions powerless, and the system depressed, while at the same time there is no blood flowing through the vagina, nor any symptom of internal and concealed hæmorrhage, stimulants are called for; and either the domestic or medicated may be allowed.

Various specific medicines have been recommended at different times, to increase the parturient throes, and facilitate the child's birth; but I believe that the whole of these substances, one only excepted, act upon the womb through the excitement induced in the arterial system. They first stimulate the nervous, then the arterial, and through the medium of those systems, the uterus. Almost the only medicine now used as a uterine excitant, is the *ergot of rye:* and I have no hesitation in declaring my opinion that its action is specific, and that the uterus is not affected through any disturbance first set up in the arterial system.

The drug has been exhibited in various forms, chiefly in powder, infusion, decoction, and tincture. The first two are in my opinion the best modes. If given in fine powder, about twenty grains is the proper dose; but I am myself generally in the habit of exhibiting it in infusion. Two drachms may be infused in four or six ounces of boiling water for twenty minutes; a fourth part of the strained liquor should be given at a time, and under labour the dose may be repeated every quarter of an hour, until either its action becomes apparent, or the whole is taken; for I consider it useless to persevere with the medicine, if the quantity mentioned produces no effect. I have found that if the infusion be allowed to stand much longer than the time I have specified, it acquires a nauseating pro-

perty which greatly distresses the stomach. Desgranges* used only the black cortical part, in which he considered its active principle to reside: he gave it in doses of four or six grains, which he found as efficacious as thirty grains of the whole powder. Villeneuve administered it in *lavements;* and he considers this the most efficacious means of employing it, provided there be present much irritability of the stomach.

I have given the ergot, in the doses recommended every four or six hours, for many successive days, on several occasions, and never knew it produce any bad effects upon the mother, except occasionally nausea and vomiting. Usually there is no more influence perceptible on the general system than would be observed after taking a cup of tea; but its effects upon the uterus in labour are often speedy, powerful, and astonishing. Its action mostly commences within fifteen or twenty minutes after its exhibition; and the character of the pains induced through its agency differs materially from the ordinary throes of parturition; so that it is possible in many cases to discriminate them, as being actually produced by the drug itself;—they are stronger and more constant than the common pains of labour. When the ergot has obtained a full power over the system, the uterus often acts without any decided intermission for many minutes together;—there being only a slight remission observed—no interval of perfect ease. This remark has been made by Ingleby† and many other physicians; and I have had myself an opportunity of observing its truth on many occasions.

As the ergot undoubtedly possesses such a strong influence over the uterine system, it is evident that, if exhibited improperly, it is likely to do great injury.

There are many cautions, then, necessary to be attended to in adopting and employing it. Its exhibition must not bet hought of in any case where a disproportion exists between the head of the child and the pelvic cavity; we should incur great danger of inducing contusion, inflammation, and laceration. Neither must it be exhibited where there is any disposition to rigidity of the parts,—either the os uteri, the vagina, or the perineum,—through fear of the same dangers. As a principle, it is not usually necessary in first children, and therefore this is a case in which we generally should make an exception. It must not be given in any case where the lingering labour depends upon a malposition of the head. It may be admissible occasionally in breech presentations; but in no case of transverse position of the fœtus, provided the term of gestation is nearly completed, should we ever contemplate administering the ergot. It must only be given in

* Neale on the ergot, p. 42.

† On Uterine Hæmorrhage, p. 79.

cases where the sole cause of delay is a torpid or feeble state of uterine action; or where it is desirable to terminate the labour speedily,—and that too by means of the natural powers,—in consequence of hæmorrhage. I have found it very useful in accidental hæmorrhage after the membranes have been ruptured; in loss of blood under abortion also, where it was impossible to empty the uterus by manual operation; and where the patient would perhaps have sunk from the continuance of the bleeding.

But although I am perfectly convinced of the powers which the ergot sometimes displays under parturition, I am by no means inclined to agree with those practitioners who think that this medicine will entirely supersede the necessity of any other means being used in lingering labour. I cannot coincide in the opinion expressed by Mr. Michell,* that its general introduction will so completely supersede the use of the forceps, that "he would not be surprised if in twenty years that instrument should be known only by name." Nor in his remark, "that except in the rare cases in which the Cæsarean operation was formerly recommended, he conceives there will now be no occasion for instrumental aid in midwifery."

Authors vary much in the statements they furnish of their success with this grain. This discrepancy may partly be accounted for by the ergot in some of the trials not being fresh, since, by being kept too long a time, it loses its virtue. It may also be owing partly to the constitution of the patient not being susceptible of its peculiar action. We know that some persons are not susceptible of the peculiar action of mercury; and we may easily believe that in the same manner some constitutions may be insusceptible to the peculiar action of the ergot of rye.

Stimulating clysters, principally composed of the purgative salts, have often been found useful in exciting the uterine fibres to more powerful contraction. External means are sometimes had recourse to for the same purpose. Warmth, applied by hot flannels to the hypogastric region, to the legs, the thighs, and the back, has been tried, but has seldom been found efficacious in restoring uterine action, unless there existed also at the same time depressed arterial energy, or a cold surface. Under such circumstances we should not only apply warmth externally, but give warm diluents, or perhaps stimulants. Pressure and friction are found to possess greater power over the uterine fibres than warmth externally applied. The pressure of a bandage, or the hand, will often excite the uterus to increased action both before and after the birth of the child. It will be shown, that in cases of hæmorrhage after delivery, dependent on a flaccid state of the parietes of the womb, we possess no more serviceable means to ensure their permanent contraction than the application of

* On the Ergot of Rye, 1828, p. 56.

pressure by the grasp of the hand; and although pressure acts more energetically upon the uterus when the organ is more or less emptied of its contents,—especially after the birth of the child,—yet firm steady pressure will sometimes excite it to more vigorous contraction, even while it contains the fœtus within its cavity. Friction with the open palm previously to the birth of the child is more frequently had recourse to under this kind of lingering labour than more simple pressure, and a most efficacious agent it sometimes proves.

I am inclined to think that electrical shocks—particularly derived from the galvanic battery—would excite the flagging powers of the uterus under labour, and perhaps even induce action *ab initio*. This is a means, however, of which I would not, in the present state of our knowledge, recommend a trial; and I only judge by analogy, in consideration of the influence the electrical fluid exerts over the nervous system, generally, and through that system, over muscular fibre.

We may sometimes also succeed in rendering the uterine contractions stronger and more efficient by changing the patient's position, particularly from the recumbent to the upright posture; and as this is a very simple means, as it is often useful, and as the change brings her great relief, she may be advised to sit, stand, or walk, as her own inclination dictates. The effect is most probably produced by the gravitation of the head upon the os uteri.

Before concluding this part of my subject, I must repeat the caution previously given against unnecessarily rupturing the membranes during the first stage of labour. It has of late become very much the practice,—attributable in some measure, perhaps, to the recommendations inculcated by Professor Burns*—to evacuate the liqour amnii in all cases where the uterus is acting feebly; and some instances have come under my own observation, in which not only has this act disappointed the intention of the operator, but been followed, after the lapse of some time, by such symptoms as required that the labour should be terminated instrumentally. I do not mean to assert that a protracted case is always a necessary consequence of such interference; for in many instances where the os uteri is perfectly dilatable, where it has acquired a diameter the size of a crown, and especially where there is an excessive quantity of liquor amnii present, the evacuation of the water—by causing the head to bear more decidedly on the os uteri—will increase the vigour of the contractions, and bring about a more speedy termination. But I allude to it as a generally adopted principle; and cannot but consider that such an

* Principles of Midwifery, 5th ed., p. 403.

interruption of nature's ordinances requires in practice the greatest possible judgment and discrimination.

Nor must I allow the custom of irritating the mouth and neck of the womb with the finger, and rubbing it down the back of the vagina, along the rectum, to pass unnoticed; nor that still less justifiable mode of proceeding—the endeavour to dilate the os uteri by the first two fingers introduced within it; which last means also has received the sanction of the deservedly great name of Professor Burns,* as applicable to some states of the os uteri; but which I do not feel myself warranted in mentioning except in terms of reprobation.

The practice indeed might be followed with less danger, if the cautions with which the professor has surrounded it were always borne in mind and acted on; but the chances are, that the principle alone will dwell in the memory, and little heed will be taken of the kind of cases in which it is recommended as useful.

2*d. Deformity of Pelvis.*—The second cause of lingering labour embraces those cases in which the uterus is acting powerfully and energetically, but where there is a want of due and proportionate space in the passages for the ready exit of the child: and of these causes, *distortion of the pelvic bones*, as being one of the most frequent and difficult, claims our first attention.

Three Varieties.—As in a former part of this publication I arranged pelves in general into four classes, so we may now, for practical purposes, divide distorted pelves into three varieties,—the *first*, in which the pelvic brim is so contracted as not to permit any part of the child's head to enter through it; the *second*, which has allowed the head to descend so low as to occupy the whole or the chief part of the cavity, but whose outlet is too narrow to admit of its escape; and the *third*—of that intermediate size—which has permitted some portion of the head to enter through the brim, and partially to take possession of the cavity; while the principal bulk remains above. These three cases practically assume a very different character, and require therefore a distinct consideration.

First Variety.—When we have perfectly satisfied ourselves, by an examination *per vaginam*, that the pelvis is so diminished in its proportions that no part of the child's head can pass through the brim, it becomes our duty not to allow the patient's strength to be undermined by the fatigue necessarily attendant upon such a labour; but early to have recourse to some means for the purpose of relieving her: because it is

* Op. citat. p. 401. The late Professor Hamilton, (Practical Observations, 1840, p. 125,) by quoting Burns' opinion and practice on this subject at length, appears to adopt them as his own; and we may fairly conclude that he gives them the sanction of his authority.

physically impossible for a head to be eventually expelled whole through a pelvis whose capacity in the superior aperture is so contracted as not to admit any portion of it, after the evacuation of the liquor amnii, and the full establishment of powerful expulsive pains.

Such being the case, the means to be adopted must become a most interesting and important question; and if, upon a measurement conducted with the utmost care, we find that there is less space at the brim than three inches and a half laterally, by one inch and three-eighths in the conjugate diameter; or three inches by one inch and a half; we ought to consider it our duty—however painful and appalling that may be—at once to propose the Cæsarean section, as the only means by which it is possible to save the mother's life; and as offering also the sole chance of safety to the child. If it be thought necessary that this operation should be performed at all, it ought at any rate to be undertaken before the patient's system has sunk, from a long continuance of the excessive exertion of labour. This recommendation I think it right to inculcate, in consequence of the difference so remarkable in the result of the cases operated upon in this country and on the continent. In the British isles, out of nearly thirty operations, we have only three instances of recovery on record—one in which an ignorant midwife in Ireland, named Donally,* officiated; another under the excellent care of the late Mr. Barlow;† and a third, where the operation was performed by Mr. Knowles,‡ of Birmingham;—while, on the continent, a fortunate termination has repeatedly ensued. How can we account for this discrepancy? The astonishingly superior success on the continent is not to be attributed to the climate being more favourable to capital operations—to the human system being in a state to bear them better—nor to the surgeons abroad possessing either more general scientific knowledge as to the mode of performing dangerous operations, better practical adaptation of that knowledge, or evincing greater care and anxiety about the result, than obtains in England—but because either the operation has been performed early in the labour, before exhaustion has supervened; or because it has been undertaken in cases when the constitution has not been so fearfully undermined by previously existing disease. We may reasonably infer, indeed, that the more distorted the person is, the more violent must have been the affection under which the system has suffered, and the less power will it possess of bearing up against such a grievous shock as the Cæsarean

* In January, 1738-39—Med. and Surg. Essays. Edinburgh. 4th. edit. vol. v. art. 38; reported by Mr. Duncan Stewart.

† In November, 1793—Barlow's Essays on Surgery and Midwifery, p. 355.

‡ In 1835—Transactions of the Provincial Med. and Surg. Association, vol. iv. p. 377.

section must occasion. In Barlow's successful case, the cause of the extreme diminution of the pelvis was not disease, but a fracture of the pelvic bones, from which severe injury the woman had perfectly recovered; and in Mr. Knowles' the operation was had recourse to thirty hours after the commencement of labour, and seven only after the rupture of the membranes.

The fact is not to be concealed, that in different parts of Europe, and especially in Catholic countries, both has this operation many times been had recourse to, under circumstances in which no British practitioner would have considered himself warranted in proposing it—where, indeed, there has existed sufficient available space in the pelvis to admit of the extraction of the fœtus *per vias naturales*;*—and also that the women, more under the influence of their clerical pastors than ours are, have readily and cheerfully submitted, from a sense of religious duty, to this dreadful expedient, while they still possessed considerable strength, that they might not deprive their unborn children of the benefit of admission within the pale of the Christian church.

When this means is considered unequivocally requisite, then, by having recourse to it early in the labour, the best chance is afforded to the patient of the preservation of her own life, as also of her infant's. Notwithstanding this, however, no rightly-judging man would venture, on his own single responsibility, to urge the propriety of an operation so unusual in its necessity, so appalling in its character, and terrible in its consequences, as the extracting a fœtus *ex utero* by an extensive abdominal incision; but, before proceeding to its execution, he would naturally be desirous to obtain the counsel and sanction of some neighbouring practitioner, in whose opinion he confided.

These cases of extreme distortion are fortunately of rare occurrence: the operation of Cæsarean section, indeed, has not been found necessary in this extensive metropolis for a great number of years, and consequently

* It would, perhaps, be unfair to adduce, in confirmation, those cases in the latter half of the sixteenth century—the second, third, fifth, and sixth of Rousset, which came under his own observation, and the ninth of Casper Bauhine, (Latin Translation of Rousset on the Cæsarean Section,) all which women brought forth live children *per vaginam* subsequently, even if they are correctly reported; because they belong to the age of barbarous surgery. But in the report of the Obstetric Clinique, at Pavia, for 1827-28, will be found a fatal case of Cæsarean operation by Professor Lovati, the dimensions of the patient's pelvis being two inches and a half in the sacro-pubic diameter, three and a half in the oblique, two in the pubi-coxygean, and two and a half between the ischiatic protuberances. (See Lancet, August 15th, 1829.) Again, in the Medicin. Zeitung, January, 1840, is detailed another fatal case, in which the operation under a twin pregnancy performed by Dr. Busch, of Berlin; here the pelvis measured two inches and a quarter in its conjugate diameter. (Medical Gazette, March 13th, 1840.) Very many instances of a similar kind might be quoted.

the chances are many against the probability of any one person falling in with an instance where he would think himself called upon to advise it. Not so, however, with the lesser degrees of diminution in the pelvic apertures: these we meet with continually; though certainly not so often in the open country, among the hardy agricultural peasantry, as among the inhabitants of great and crowded cities, and the population of manufacturing districts.

If, then, a case come under our notice in which there is more available space than that I have just noted as imperatively requiring the excision of the child from the uterus through the abdominal parietes; and yet where the pelvis is so small that we are persuaded the child's head cannot pass entire, provided it have arrived at full intra-uterine maturity;—a case, for instance, in which the conjugate diameter at the brim measures about two inches;—it would still not be right to let the patient struggle very long in labour without means of relief being used: but we should perforate the head while the system yet retained its vigour, that we might have the advantage of full unimpaired uterine energy to aid us in our extractive efforts. I trust it may not be for a moment imagined I recommend that perforation should be had recourse to early in labour in all cases where we are likely to find it necessary afterwards. It is only in those instances where a moral certainty exists that the child cannot pass unmutilated, that we are at all authorized to adopt this extreme measure, before urgent symptoms of danger to the mother's life have supervened, unless there be the most unequivocal proofs of the child's death.

Fortunately it is not necessary to draw a minutely nice distinction between those cases in which it is desirable that craniotomy should be performed comparatively early, and those absolutely requiring the same operation later in labour; because, inasmuch as the means used are similar under both circumstances, it will seldom prove of material importance —provided the child *must* be sacrificed—whether the dreadful expedient be undertaken an hour sooner or an hour later. But the case is widely different when it becomes our painful duty to discriminate between a pelvis through which a head can be extracted after the brain has been evacuated, and one that will not allow the passage of the child when lessened even to the utmost degree that art can accomplish. For it would be to the last degree heart-rending and painful—after having perforated the skull and made forcible attempts to extract *per vias naturales* —to discover that the pelvis did not afford sufficient room for the completion of delivery; but that the case required to be terminated by the abdominal incision. Not only, indeed, must the infant then necessarily be brought into the world dead, but the patient would be subjected to much additional and unprofitable agony during our efforts at extraction

through the pelvis. A diminished chance of ultimate recovery would also be offered to her, in consequence of the pain and exertion attendant on our frustrated endeavours, and the pressure, and perhaps contusion, to which the soft parts must have been more or less exposed.

I have already laid it down as a general principle, that unless there be a clear available space of three inches in the conjugate by four in the lateral diameter at the brim, we are not to expect that the child will be born without assistance; but it is not merely because the pelvis is deformed to such an extent that we are authorized to interfere while the powers are vigorous: because the child may be immature; its head may be small; the bones may be less ossified, and may overlap each other more than is usual; and a greater probability may therefore be afforded of a natural termination of the case. Under such circumstances, it becomes our bounden duty to wait till the exertion that has been sustained has produced no small degree of exhaustion, before we have recourse to such a horrible alternative as the instruments for craniotomy supply. On the contrary, however, if the space exceed two inches but in a trifling degree, it is very evident that a child, sufficiently perfected in the womb to sustain independent existence, cannot be expelled whole; and we are therefore fully justified, under this particular degree of disproportion, in interfering early—however revolting to our feelings it may be—lest our patient should sink under the effects of long-continued and painful toil; lest she should sustain a rupture of the uterus, or suffer such an extensive destruction of the soft parts from pressure, as must render her a burden to herself and an object of compassion to her friends for the remainder of her life.

In the *second variety*, where the head has entirely passed the pelvic brim—has become jammed in the cavity, and, for want of sufficient space in the outlet, cannot make its exit—the woman generally suffers extreme pain not only from uterine contraction, but from uninterrupted pressure on the structures within the pelvis. We must bear in mind that the pelvic viscera are exceedingly nervous, very liberally supplied with blood-vessels, and are peculiarly exposed to those unhealthy actions inseparable from a high state of vascularity; that, although they possess great restorative power within themselves, inflammation induced by contusion, the result of pressure, is very likely to terminate in suppuration; and particularly in gangrene. When a disposition to sloughing once commences, it is impossible to say where the destructive process may stop: beginning in the lining membrane of the vagina, all the vaginal coats may take upon themselves the same morbid condition; the bladder and rectum may be implicated, and the three cavities may be thrown into one,—than which it is impossible to conceive a more miserable state of human existence.

Whenever the head is locked in the cavity of the pelvis, we must eminently fear contusion, inflammation, suppuration, and sloughing. We have, also, to dread injury to the bladder:—that organ may burst, or fatal inflammation may occur, consequent upon its over-distention. There is, likewise, great danger to the child, from the compression which the brain must suffer, under impaction; as well as from the pressure to which the funis umbilicalis must be exposed.

This case, then, is one of a very dangerous and difficult character; and it becomes a most delicate question, how long we shall allow nature to struggle unaided;—and whether, at any particular period of time, we shall have recourse to instrumental means. Many rules have been laid down for our guidance under this emergency, for the consideration of which an opportunity will be afforded in a subsequent part of this work.

I have considered that the *third variety*, where the head is partly protruded through the brim, the vertex dipping into the cavity, while the principal bulk remains above. A case in which the pelvis measures about three inches in its conjugate diameter, is of this description. But it cannot be impressed too forcibly or too frequently on the mind of the student, that although we know the size of the pelvis accurately, and have ascertained beyond a doubt that its measurement is even rather below three inches than above it, we are not, on that account alone, warranted in taking an instrument in hand: for it must have occurred to every practical man frequently to have observed the head wonderfully adapt itself to the irregularities of the pelvis; so that eventually it makes its exit, under circumstances which a few hours before allowed of no expectation, and but little hope, that a natural and unaided termination would be effected. We must not, therefore apply instruments merely because there is a small pelvis, provided it be moderately capacious; but we must give a full and fair trial to the powers of the uterus; and watching attentively both the progress of the head, and the effects of the continued efforts on the mother's system, hold ourselves in readiness to terminate the labour on the first accession of such symptoms as may bring her life into present jeopardy. By some we are recommended, in cases likely to be rendered difficult and protracted by the slighter degree of distortion,—embraced under the head we are now discussing,—to introduce the hand into the uterus, grasp a foot, oblige the fœtal body to revolve on its own axis, and bring the breech into the pelvis, terminating the labour by the operation of *turning*.* I cannot find language sufficiently strong in which to deprecate this mode of proceeding, as a general principle. The dangers which envelope it

* Vide Baudelocque, parag. 1294.

are many and great, both to the mother and her infant, and have already been partially glanced at. I have good reason to believe, and to hope indeed, that such a means of concluding such a case is now entirely exploded from the practice of the well-informed obstetrical surgeon.

3*d*. *Tumours in the pelvis.*—The third cause of lingering labour is the *presence of tumours* in the cavity of the pelvis. The tumours which may impede parturition vary exceedingly in their nature, consistency, and size; sometimes they possess the solidity of bone itself; at others, their contents are of the most fluid character. According to their size and unyielding nature, will be the difficulty which they occasion.

Exostosis.—The most solid of all the tumours that we meet with in the pelvis, is a knobby, bony growth, taking its origin from some portion of the parietes themselves;—an exostosis. But it is fortunately of very rare occurrence; indeed, so infrequent, that I have myself never met with an instance. It is generally situated at the back part, behind the rectum, and springs from the cavity of the sacrum. This kind of tumour we shall mostly be able to discriminate by its situation, its extreme hardness, the irregularity of its surface, its immobility, its knotty feel, and insensibility to pressure.

Treatment.—Our treatment of a case rendered lingering by the presence of a disease of this description, will altogether depend upon the size of the growth itself. If it be very small, it is probable that the head may pass without assistance; but if, on the contrary, it be large, occupying a considerable space—since it would be impossible to remove it by operation, so as to render the cavity more capacious—we must be guided by the common rule, (provided there be the most distant probability of the child's passing,) that of waiting until symptoms appear which demand delivery; and according to the magnitude of the tumour we must select our means: the forceps, long or short, if they offer a fair chance of success, should be preferred; if neither of those instruments avail us any thing, we must call in the aid of the death-inflicting perforator. It is certainly possible that an exostosis may have attained such a size as not to leave an inch and a quarter of space between the anterior and posterior parietes of the pelvis. In such a formidable case,—as we should not be able to extract the fœtus through the vagina, even although we might succeed in diminishing its volume to the smallest practicable size,—we should be compelled to have recourse to the Cæsarean section.

Schirrhous or dropsical ovary.—The ovary is liable to diseases of various kinds, of which dropsy and schirrhous are the most frequent. Under both these affections the gland becomes very considerably enlarged; and when it is the subject of dropsy, its coats are extended to an enor-

mous size, containing in some instances many gallons of fluid. We cannot be surprised, then, at the impediment offered to the child's birth, if pregnancy and an ovarian tumour exist together. When enlarged by disease, the ovary generally rises by degrees from the pelvic into the abdominal cavity: but occasionally it becomes bound down by adhesive inflammation to the subjacent parts; and if, under such a state, the woman conceives and carries her fœtus to the full period, her labour must necessarily be difficult. Even if it be not confined to the pelvis by adhesion, it may be found in labour occupying the cavity more or less, never having commenced its ascent into the abdomen; being prevented, perhaps, by the gravid uterus, which has already taken possession of that space. Or a portion of the tumour may have prolapsed, and subsided during gestation; for pregnancy by no means interferes with the continued progress of such an enlargement.

The situation of this tumour is also external to the vaginal coats, and it is generally to be felt towards the posterior part of the pelvis. It will probably be somewhat moveable; it will neither be so hard nor so irregular as an exostosis, and will most likely possess more sensibility.

Plate XXX. fig. 92, displays an enlarged ovarium occupying the pelvic cavity, and impeding the descent of the head. The principal features of this plate are copied from a drawing given by Merriman in his excellent synopsis. A the os pubis, B the enlarged ovarium lying in the cavity of the sacrum, between the rectum C and the posterior wall of the vagina D, consequently *outside* the vaginal canal.

Treatment.—The treatment under such circumstances must likewise depend upon the size and solidity of the tumour. If its true character be detected before the head has become much engaged in the pelvic brim, we may possibly,—provided it be free and not adherent,—succeed by steady pressure in pushing it up above the brim, and consequently out of the way of the head's advance.* If we cannot accomplish this object, we must act upon common principles, and wait until symptoms appear requiring our interference: for if the tumour be soft, it is very probable that the descending head will compress it into a flattened form, or squeeze a part of its contents upwards above the brim, and thus diminish its resisting power: while, on the contrary, if the disease be of a solid kind, it would be wrong to have recourse either to obstetrical

* Merriman (Med. Chirurg. Transactions, vol. x. p. 61) gives a case in which he pushed a tumour, occupying the pelvis in labour, above the brim, without difficulty, and thus procured room for the birth of a living child. A patient of my own has an ovarian tumour which has impeded delivery in two of her labours; on both of which occasions I succeeded, with very little trouble, in raising it out of the way of the head's descent.

or surgical instruments, until necessity cempelled us. When this necessity appears, it will be for us to determine whether we shall puncture or excise the tumour, or whether we shall extract the child by instrumental aid. It is impossible to lay down any general rule applicable to every individual case; but we may establish the principle, that if the swelling possess the least evident degree of fluctuation, a puncture should be made into its substance by means of a trochar introduced through the vagina or rectum. Even if the disease be simple dropsy, we must not expect to evacuate all the fluid, because most probably the tumour will be formed of separate cysts of different sizes, possessing no communication with each other: but we may let out a part of the contained water; and if, fortunately, the cyst we puncture should be large, we shall reduce the general bulk so much as to afford a fair chance for the head to pass. Should the contents, however, be found of a semi-solid or gelatinous consistence, too thick to run through a trochar, it would then be right to make an incision into the mass from the vagina, of half an inch or an inch in extent, with the hope of entirely evacuating the sac. If, lastly, by these means we effect no material diminution in its size, we must determine whether we should extirpate it through the vagina, or deliver the child either by the forceps, or by opening the head. If there be the least chance of delivery being effected by the forceps, that would be preferable to either of the other methods; but if the forceps fail us, we have no choice left, except either dissecting out the tumour, or perforating the skull. The removal of the diseased mass would, no doubt, be both very difficult and hazardous on many accounts; and horrible as the alternative is, I should, in my own practice, rather destroy the child than subject the mother to such a formidable operation.

Schirrhous glands.—Another species of tumours offering an impediment to the head consists in the glands situated along the hollow of the sacrum having become affected with schirrhous enlargement.

Schirrhous glands may be detected by their situation, irregularity, and hardness—by their being very sensitive—by their forming a chain of indurated tubercles also external to the vaginal coats—and by their being more or less firmly attached to the surrounding structures. Concerning the treatment of such unusual cases, I have nothing to add to what I have just advanced in regard to enlarged ovaries.

Abscesses will occasionally form in the pelvis during pregnancy, and in this case there would be decided fluctuation present. An abscess might be distinguished from a dropsical ovary by its situation, perhaps—its excessive tenderness on pressure—and its formation having been preceded and accompanied by symptoms of local inflammation, and indications of

the suppurative action. An error in diagnosis, however, would be but of little consequence, since the treatment employed in the two cases must be essentially and positively the same. There could be no hesitation in puncturing such a swelling through the vagina, and letting out the pus. The difficulty would then be over, and the head would most probably pass.

Polypi.—Tumours, however, formed within the uterus, or growing from the internal surface of the vagina, will sometimes impede the passage of the head. These are of a polypus character; they are fleshy and solid in their structure, and grow occasionally to an amazing size. It is singular that the presence of an excrescence of this kind in the uterus does not prevent conception taking place; which fact I have myself had more than one opportunity of witnessing. Plate XXXI. fig. 93, shows a polypus A, lying in the vagina, and filling the pelvis to such an extent as to prevent the passage of the head. B the posterior wall of the vagina, behind the tumour, which consequently is situated *within* the vaginal cavity.

A case is detailed by my father,* which came under his observation, as well as mine, in 1824, that offers some valuable points of practical instruction. He had been requested to superintend the labour of a woman pregnant of her third or fourth child, but was from home when the messenger arrived to summon him; I consequently went in his stead. I found her suffering severe pains, and using forcible bearing-down efforts, under the belief that the child was about to pass immediately. On making the examination, I instantly detected that the pelvic cavity was occupied almost entirely by a solid fleshy tumour, much larger than a goose's egg, which was pressing considerably on the perineum: the os uteri, at the brim of the pelvis, was dilated to about the diameter of a crown piece; and the membranes, unruptured, were being forcibly propelled against the upper part of the tumour with the return of each uterine contraction. I was at no loss to determine that the tumour was of a polypus character, by its firm consistence, its shape, its situation *within* the vaginal cavity, and its attachment within the os uteri. The mouth of the womb dilated rapidly the membranes burst speedily; and in less than an hour after my arrival, the head, under the action of powerful throes, forced the principal bulk of the tumour external to the vulva, (which still, nevertheless, retained its attachment to the uterus by the stem) and itself instantly followed. At the same moment my father entered the room, and with myself, had an opportunity of examining the tumour lying forth between the thighs. Now, however, that the difficulty, as far as regarded the

* Practical Observations in Midwifery, Part II. p. 473.

birth of the child, was removed, it became a question in what manner the polypus should be treated;—whether it should be taken away immediately by a knife, after having secured the vessels of the stem by a ligature; or whether it should be returned into the vagina, and a future opportunity taken of tying it, according to the commonly-adopted method. In favour of the first suggestion, it might have been urged that the tumour was at that time so completely under control, as to render the operation one of the easiest description; and against it, that the difficulty of surrounding the stem of a polypus, lying in the vagina, by means of the double canula, is but trifling; and, in the case before us, might easily be accomplished at any time. Besides,—the uterus being so eminently disposed to take upon itself inflammatory action in all cases after delivery,—there was great danger lest the double irritation of the inflicted wound and the attached ligature should excite a disease which it would be difficult to keep in check. Again, it seemed likely, that, as the adventitious growth was nourished by the same vessels which supplied the uterus, these vessels had become enlarged in a proportion somewhat equivalent to the increase in the calibre of the uterine vessels themselves. If such were the case, it was fair to infer that, as the uterine vessels shrank after delivery, the vascularity of the polypus would also be materially diminished; and that this diminution in the bulk of the morbid growth would render its removal altogether less formidable. These reasons induced us to delay the operation at least until the changes consequent on delivery were accomplished, and the puerperal state had terminated. The result both justified our expectations, and confirmed the correctness of our reasoning; for my father made several vaginal examinations during the few first weeks after delivery, and satisfied himself that, as the uterus contracted, the tumour also lessened in size. After the lapse of nearly four months—no symptoms appearing in the mean time to call for earlier interference—the polypus was tied in the usual manner, and sloughed off in five days; and at the time of its removal, its size was scarcely so great as a walnut divested of its outer husk.

Diagnosis.—There can be but little difficulty in detecting a case of this kind. The pear-shaped, solid, tumour will be felt more or less occupying the cavity of the vagina, attached by its pedicle either to the vaginal membrane itself, or to the uterus; or the stalk will be lost, as it were, in the cavity of the uterus, and the point of its connexion with the healthy structures will not be discernible; we shall be able to pass the finger all around it, to encompass its bulk and determine its shape.

Treatment.—Should a tumour of this description have acquired such a magnitude as to offer great resistance to the passage of the child's head,

Fig. 93.

Pl. XXXI.

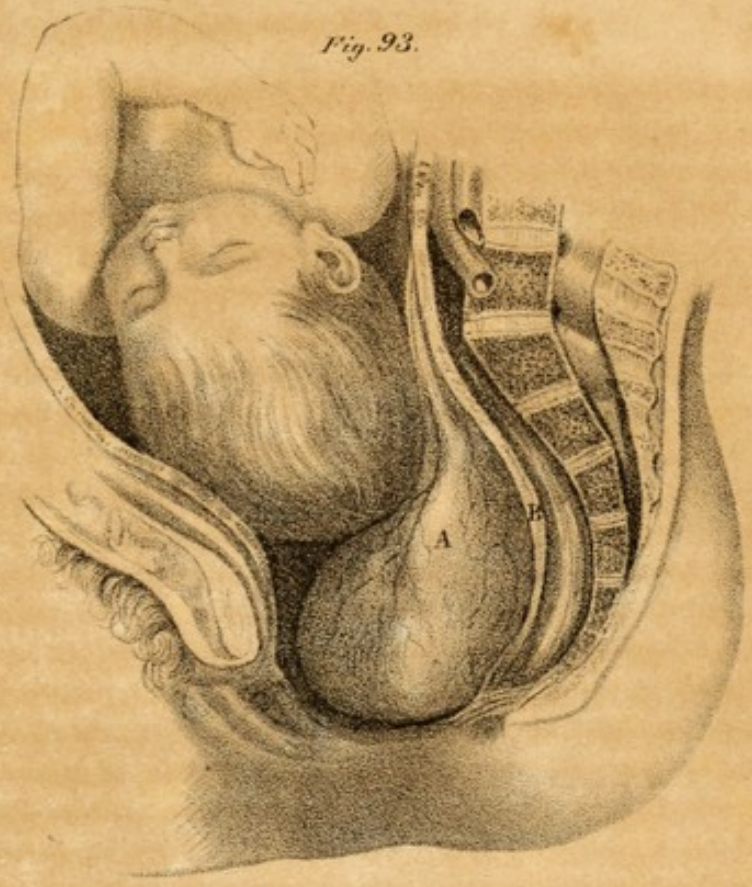
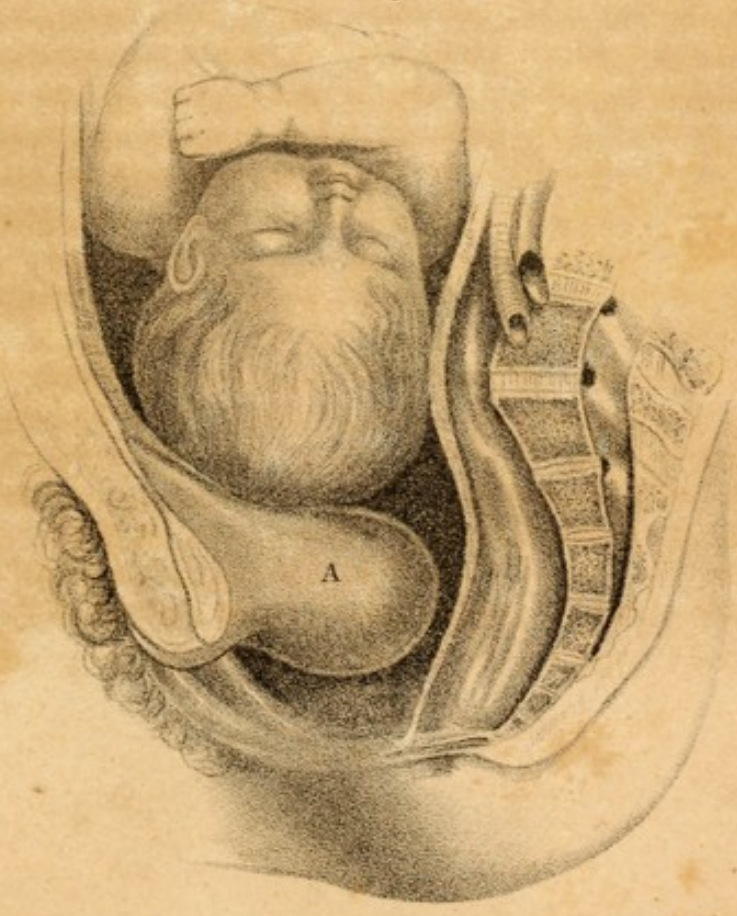


Fig. 94.



Sinclair's Lith.

we must to a certain extent follow the common principles, already inculcated; and give nature a fair trial, in the hope of witnessing a termination such as I have just detailed. But if the powers begin to fail—if the parts become tumid, hot, or dry, showing a disposition to inflame, then it will be necessary to interfere; and the question will naturally arise, whether we shall remove the tumour, or deliver the patient by instrumental means. If we can deliver easily by the forceps, we had better have recourse to them, because they do no injury either to the child or mother; but if delivery is impracticable through their agency, rather than perforate the skull, a ligature should be put around the stem, and the tumour should be cut off below. On the removal of the morbid mass, the child's head will probably be expelled.

Descent of the bladder.—The bladder sometimes prolapses before the head; of which accident I have seen many instances. Much embarrassment, and no small danger,* may be the consequence of the case being overlooked or mistaken. This usually occurs in the early period of labour, before the head has engaged in the pelvic cavity, and depends on pressure exerted by the descending head upon the fundus, or middle portion of the organ, at a time when it is partially distended with urine. Plate XXXI. fig. 94, shows the bladder, A, thus prolapsed, a part of it being retained in its ordinary position by its attachment to the abdominal parietes.

The symptoms attendant on prolapsed bladder are very distressing; there is a painful sensation of fulness, tension, and pressure downwards, in the situation of the pubes; with a feeling of dragging from the navel, or rather the mid-space between the navel and pubic symphysis; constant desire to micturate; and inability to void urine on the exercise of the will; and sometimes an involuntary escape on each return of uterine contraction. On examination *per vaginam*, the finger will detect a soft fluctuating tumour filling up the anterior part and one or both sides of the pelvic cavity, below the fœtal head; and the patient will complain if steady pressure be made on it. The introduction of the catheter, which may be easily accomplished, will at the same time withdraw the fluid, cause the swelling to disappear, and relieve the characteristic suffering. Keeping

* See Merriman's Synopsis, p. 202, for a case where an inconsiderate practitioner thrust a sharp instrument into the bladder, under the belief that the swelling was a hydrocephalic head. Hamilton (M. S. Lectures, 1821) used to tell of another equally rash, who mistaking the prolapsed bladder for the membranes of the ovum, punctured it, with the intention of letting off the liquor amnii. I can readily imagine that the distended organ in this situation might be mistaken for a dropsical ovary, and its contents discharged by puncture or incision, if the precaution of introducing the catheter were not used.

in mind the possibility of the bladder being pressed downwards as described, it is an essential duty never to puncture any fluctuating pelvic tumour, without being first assured that it is not vesical, by the removal of the urine by means of the catheter. A chronic prolapsus of the bladder is likely to follow its accidental descent in labour.

Scybalæ.—There is still another adventitious tumour which may impede the passage of the child;—a collection of fæces in the rectum. It is not usual to meet with a case of this kind in the higher classes of society; but it is by no means uncommon among the lower orders; and I have seen more than one instance, in which the mass contained within the rectum was so hard and so large, as for some time to obstruct the exit of the head.

It is not likely that we shall confound this cause of protraction with any morbid pelvic growth; because by passing the finger into the vagina, and tracing the rectum, that gut will be felt bulging forward; but if any doubt remain, an examination of the rectum itself will generally dissipate it.

Treatment.—The obvious indication here is, to evacuate the bowel of its contents. This may be done by throwing up twelve or fourteen ounces of warm water, so as to liquify the fæces and dislodge them. But cases have occurred in which all attempts to inject a fluid were rendered nugatory, in consequence of the hardness and compactness of the mass. It has been advised that we should, in such an aggravated state, endeavour to empty the rectum by means of the handle of a spoon. It need scarcely be remarked, that this cause of difficulty may be entirely obviated by proper attention being paid to the due evacuation of the canal during the last five or six weeks of utero-gestation.

4th. Rigidity of the soft parts.—A fourth cause of lingering labour consists in rigidity of the soft parts through which the child must pass: and this is a subject of great interest, because of its frequent occurrence, the excessive pain generally attendant upon the case, and the difficulty that is often experienced in overcoming the resistance occasioned.

It has been already shown, that rigidity may exist in the os uteri, the vagina, or the perineum, separately; but we usually observe that when one part is affected, all the structures partake more or less of the unhealthy condition; so that even after the os uteri is fully distended, much delay and distress is experienced in the dilatation of the vagina and external parts.

Women who are bearing their first child,—especially if they have entered the middle period of life,—those who possess a strong constitution

engrafted on a vigorous and rigid fibre, are the most likely to suffer from this cause of protraction. To add to the distress, it is very usual, when extraordinary rigidity exists, for the membranes to break early in the labour; and this unfortunate occurrence much aggravates both the pain endured, and the tediousness of the dilating process.

Cases rendered lingering by preternatural rigidity are exceedingly perplexing, and often very unmanageable; they are frequently followed by inflammation of the uterus or vagina, by abscess, and sloughing. As each of these states deserves a distinct consideration, I shall first call my reader's attention to rigidity of the os uteri.

Rigidity of the os uteri.—When a woman has borne a number of children, the uterine mouth generally dilates very readily, and therefore we may expect to meet with this cause of difficulty more frequently in primary labours; but this is by no means universally the case. A very uncommon exception to this general rule came under my observation on one occasion. I attended an unmarried woman, pregnant with her first child, who was in as comfortable circumstances as her situation would admit of. When labour set in, the os uteri opened with no difficulty, and the child was born in four or five hours from the time I was summoned. She again became pregnant, but it was under very different circumstances; and her mind was much more disturbed than on the first occasion. On the accession of labour the membranes broke early; the pains soon became exceedingly violent; the head was urged powerfully against the undilated and rigid os uteri; irregular muscular spasms supervened; and at the end of about fifty hours from the rupture of the membranes,—when the dilatation acquired did not exceed the diameter of a shilling, while I was instituting an examination, in the acmé of a strong pain, with the greatest possible care, I felt the os uteri split on the right side, and I traced the rent considerably upwards through the cervix. At the same moment the head passed into the vagina, and was expelled by a continuance of the same contraction. During the process of this labour, I bled the patient to syncope three different times, and exhibited opium freely, my mind being impressed with a dread of the very accident which occurred. It is an instructive case, because it proves, that although an os uteri has relaxed and dilated readily in a first labour, it may on after occasions possess a high degree of unnatural rigidity,—and that, too, independently of the existence of any discoverable disease in the organ itself. It proves, also, that the much vaunted power both of bleeding and opium will not always avail in removing rigidity. The poor creature died on the fourth day after delivery, of uterine inflammation.

More recently I was requested to take charge of a lady, the mother of

nine children, who was suffering much from anasarca, with the abdomen immensely distended, partly from the enormous size which the uterus had acquired, and partly from fluid in the peritoneal cavity. The os uteri, from the beginning of labour, bore a thick, soft, puffy, œdematous character; its dilatation proceeded slowly and painfully; the membranes broke at one in the morning, when it was dilated to the size of a crown. At four its diameter was very little more; and while I was in the act of examining, during a strong pain, as in the last-mentioned case, I felt it tear at the back part, in a direction upwards. The finger, on being withdrawn, was tinged with blood. The child was born at five; its weight was twelve pounds and three quarters. The shoulders were so broad as to give me much trouble in their extraction. During the interval between the birth of the head and passage of the shoulders, the child gasped once; but died immediately on its expulsion. The uterus contracted and expelled the placenta; there was some after-hæmorrhage, though not to an alarming extent. The patient suffered neither pain nor any kind of distress till the expiration of thirty hours, when she was seized with a violent rigour, followed by copious perspiration. The pulse rapidly rose to one hundred and forty, and one hundred and fifty beats in a minute; the skin became hot; great loss of power supervened; the tongue and hands were very tremulous; the nights were passed without sleep; the breathing was quick, but not painful; no milk was secreted; yet the lochia flowed naturally; the stomach never rejected its contents; the urine and fæces passed without pain; and there was but little uterine tenderness: but the countenance gradually became more depressed and anxious; and on the fifth morning after her delivery, she was suddenly seized with great difficulty of breathing, and died in an hour from the accession of this symptom.

To another case I was called, in consultation, where the os uteri had entirely sloughed off, in consequence of the strong pressure to which it had been exposed for a great length of time. This fact, sufficiently evident before delivery, I had an opportunity of ascertaining beyond a doubt by dissection. There existed, also a slightly distorted pelvis. A case occurred to Mr. Scott, of Norwich, in which the os uteri together with a considerable portion of the cervix was torn off by the force of the uterine contractions, and came away in an entire state, presenting the appearance of a circular fleshy substance, having a central aperture. The patient eventually recovered, after hovering for a long time on the brink of destruction.* These last two accidents occurred under first labours.

Disease in the os uteri causing rigidity.—Sometimes the os uteri is

* Med. Chirurg. Transact. vol. xi. p. 292.

rigid from disease, particularly schirro-cancer, and cauliflower excrescence—states which do not prevent conception, but must give rise to more or less difficulty in labour.*

* It has happened to me to see two instances of labour in which the mouth and neck of the womb were extensively affected with cancerous ulceration; and one in which a cauliflower excrescence of two years' growth, and of large size, was attached to the same organ. The first two cases occurred in patients of the Royal Maternity Charity, and I had been attending both for some weeks before labour. One of these women (in whom the whole disc of the os uteri was destroyed by malignant ulceration, the vagina being extensively affected also) went into labour rather prematurely; the process was so rapid, that the child was born before the midwife could arrive. The woman died in the second week after her delivery, and dissection proved the disease to have acquired the aggravated extent above described. In the other case the os uteri was but partially destroyed; the remainder was thickly studded with schirrhous tubercles. The patient was worn down to the lowest ebb of life, and,—to lull the acuteness of her sufferings,—had been in the habit for many weeks of taking two ounces of laudanum daily. I was summoned by the midwife soon after the commencement of labour, and on my arrival I found that death had just taken place. There were present unequivocal proofs that the child was not alive, and it was therefore useless to extract it then. On opening the body next day, the os uteri was found dilated to about the diameter of half a crown, partially ulcerated, the principal portion thickened, and exceedingly indurated. The membranes were ruptured; and although so short a time had elapsed from the commencement of uterine contractions, the patient had evidently sunk exhausted.

The lady who was the subject of the cauliflower excrescence had borne one living child seven years before the time I speak of; and my father had been attending her for nearly two years for the uterine affection, during which she had once miscarried. She became pregnant a second time while labouring under the disease; abortion was threatened, but was with care averted. The membranes broke early on the morning of Sunday, May 26th, 1828, and uterine action came on at noon; when my father was called, he found the os uteri would just admit the tip of the finger. The pains continued strong all day, with scarcely any increase in dilatation; and at night an opiate was given, which procured an intermission of suffering, but no sleep. The process of dilatation went on very slowly through Monday, the pains continuing regular and powerful. I saw her for the first time at half past eight that evening. The os uteri was then dilated to the size of a crown; and from its whole disc a fungous tumour sprang, which filled a large portion of the vagina: the cervix was exceedingly indurated all round; the pains were very strong, and the vertex was being forcibly protruded with each return of uterine action, partially through the undilated and unyielding opening. Still the constitution had suffered but in a slight degree from the protraction of the labour, although so intensely painful. It was considered that it would be premature to adopt any means for delivery just then; and it was arranged that I should remain up with her during the night. Very little alteration was perceptible till half past three in the morning, when, under the influence of a violent contraction, she suddenly screamed out that the child was passing. Being in the room at the moment, I instantly made an examination, and found the head had escaped through the os uteri, and was occupying the pelvis: in about half an hour it was expelled. The child was alive, and is so, I believe, still. The placenta gave no trouble. From the rapidity with which the child's head passed through the os uteri, the violent shriek, and the rending sensation by which it was accompanied, I have little doubt that a laceration of the organ occurred; although, owing to the confusion of parts consequent on the presence of the spongy tumour, I did not detect any breach of substance; nor, indeed, was I anxious to disturb the tender structures by making a prolonged and very minute examination. For a

When the os uteri is diseased, we shall mostly find it irregular, knotty, and very painful to the touch. Symptoms indicating morbid change will probably have existed prior to labour; and—from the history of the previous sufferings alone—there can be little difficulty in ascertaining the nature of the case. If it be not much dilated; if we find it very thick, tuberculated, and in part ulcerated; if it be very tender; and if there have been previous symptoms of uterine affection,—such as acute pains, occasional and irregular eruptions of blood, constant or very frequent, sanious, fœtid, acrid, or serous discharges from the vagina,—we can have no hesitation in pronouncing that the os uteri is in an unhealthy condition.

Treatment.—Under malignant disease of the mouth of the womb, it is very possible that a natural termination may occur, as in two of the cases I have related in the note. It would, therefore, be proper to delay the application of any means of relief, so long as is compatible with the patient's immediate welfare; moderating, at the same time, excessive action by opiates taken into the stomach, or exhibited *per anum*. Mostly, the patient's system will have been too much depressed, by the wasting nature of the disease to allow of the abstraction of blood; nor, indeed, could we expect bleeding to be followed by relaxation of the organ, when its structure is thus morbidly affected. Nevertheless, we must affix a limit to our passive treatment; for, as in more ordinary cases, a period may arrive, beyond which we cannot trust to nature. Should we observe, then, incipient symptoms of exhaustion; should the pains begin to flag; and should an increased quickness of pulse, a more anxiously dejected countenance, or distressing attacks of vomiting, indicate impending danger, it would necessarily become an anxious question, what means should be adopted in order to afford relief. Delivery offers the only chance of preserving the patient from her approaching fate. But, under the undilated state of the os uteri which I am supposing, it would be impossible to apply the forceps, or use any other means compatible at the same time with the child's existence, and with the continuity of the mother's structures. We have, therefore, the choice only of either delivering by instruments, which must necessarily destroy the infant,—provided it be at the moment living,—performing the Cæsarean section, or dividing the diseased part to a sufficient ex-

fortnight she continued in imminent hazard, but at the end of a month was able to leave her room. I was in almost daily attendance on this lady for fourteen months after her delivery, when she sank, worn to a skeleton by pain, hæmorrhage, and serous discharges. So profuse was the exudation of that peculiar serous discharge, eminently characteristic of cauliflower excrescence of the os uteri, that for some time before her death she was compelled to use three dozen napkins in the four-and-twenty hours, each of which was perfectly saturated with moisture. This discharge was for the most part untinged with any colouring particles; but occasionally it possessed the whole constituents of the blood; and dangerous flooding at different times occurred.

tent to permit the child to pass. I presume the abdominal incision would not be contemplated if the pelvis were of ordinary capacity; and we should, therefore, be driven to the alternative of either perforating the head, or making a division of the mouth and neck of the womb itself. Considering, then, that the woman labours under a disease which must terminate in death,—and that probably at no very distant period;—that the os uteri would most likely be torn in our attempts at extraction; that the incision would not necessarily be followed by fatal consequences,—whilst at the same time, after perforation of the head, the child must certainly be born lifeless,—I should prefer operating on the os uteri, unless, indeed, there were present the most unequivocal signs of the child's death: and I should even hope for the patient's survival for some time, being cheered by the result of the last case detailed in the note, in which I have not the slightest doubt that a laceration occurred.

Common rigidity.—The rigidity usually met with, however, is independent of diseased structure, and is known by the os uteri being hard, firm, and only in a slight degree painful—by its resisting the dilating powers of the membranes, or fœtal head—and by our not being able to make any imppression on its edge by the finger. It is not likely that we can mistake a case of rigidity of the os uteri for one in a more natural state. It must be recollected, however, that rigidity of the soft parts may co-exist with a deformity of pelvis; and that each of these causes may, at one and the same time, tend in some degree to retard the process of labour.

Treatment.—Under this simple rigidity of the os uteri, it is our duty, if possible, to produce a relaxation in the organ; and we are possessed of some means which have been esteemed highly efficacious. Observing how supple and distensible the os uteri becomes, and how readily it usually dilates under hæmorrhage, bleeding has very generally been adopted to effect this object. This is certainly a powerful, but by no means entirely a safe agent; and, unless used with much judgment, is likely to be productive of serious evil. The great objection that attaches to bleeding at the commencement of labour, is, that there must necessarily be a certain quantity of blood lost after the child is born. We are in perfect ignorance how much that may amount to; and it would be wanton to take blood from the arm without grave occasion, when the few ounces we may voluntarily abstract,—had they been preserved in the woman's system,—might have turned the vacillating beam of life in her favour, and snatched her from impending death. This, however, is but a remote, though probable, danger; and it becomes a question, whether we ought to take into account a remote probability, when weighed against a state of actual and existing difficulty. My father* has always used the lancet with caution

* See Practical Observations in Midwifery, Part I. p. 231.

under the first stage of labour, in consequence of the risk of flooding afterwards; and I, in conformity with his views, adopting his sentiments, and relying greatly on his practical experience, seldom direct bleeding in the first stage of labour, for the purpose, simply, of overcoming rigidity. There are about two thousand three hundred women, in one charity, annually delivered under my immediate superintendence; these patients' labours are not of more than an average length, and there are actually fewer deaths among them than we meet with in the higher circles, relatively to the amount of cases. Of this number I scarcely bleed one under labour, unless the os uteri be so painful as to indicate an inflammatory condition, or there be evidences of undue determination of blood to the brain, or symptoms of congestion or inflammation of some other viscus. At the same time it is but fair to state that my father, although he is adverse to indiscriminate bleeding in all cases of rigidity of the os uteri, considers it sometimes useful to soften and relax that organ; that Merriman* speaks with praise of this means occasionally; that Dewees† thinks it certain and never failing in its effects; Blundell,‡ Burns,§ and other eminent practitioners recommend it; and Hamilton‖ used to assure his class that he could always relax the os uteri by bleeding; and that he never allowed the first stage of labour to continue longer than twelve or fourteen hours, so completely had he the process under his control; he stated, also, that he never had had a patient in labour more than twenty-four hours, except where disproportion existed, since he began this practice. There is certainly no doubt that the robust constitutions of the northern females bear depletion better than the comparatively weak system of this metropolis. This observation also holds good in regard to the country: and those who are engaged amongst a race of peasants can no doubt have recourse to bleeding more frequently with advantage, than others can dare to do who are located among a population enervated by luxury, or debilitated by the want of wholesome air, food, and exercise.

With regard to bleeding, then, as a means of relaxing the os uteri, I look upon it as powerful, but not devoid of danger: to do good, it must be carried far enough to make an impression on the general system; for it is idle to expect advantage will be derived from it, unless syncope, or at any rate a degree of faintness, be produced. But there are some constitutions

* Synopsis, p. 29.

† Essay on Facilitating Cases of Difficult Parturition, p. 98.

‡ Obstetricy, by Castle, p. 601.

§ Principles of Midwifery. Fifth Edition, p. 411.

‖ MS. Lectures, 1821. See also Practical Observations, p. 137, where bleeding is recommended; and p. 120, where the necessity of securing the termination of the first stage within the specified time is insisted on.

which bear the loss of blood so ill, as to preclude the use of the lancet entirely; and yet in such we may possibly meet with preternatural rigidity. Even the warmest advocates* for the depleting system acknowledge this to be the case; and other measures have consequently been had recourse to with the same view.

As second in importance, rank opiate enemata. Opium, whether exhibited by the mouth, or in injection,—provided it be used in sufficient quantity,—will suspend uterine action, as well as relieve muscular spasm. If the contractions then are not powerful, it would be wrong to administer it. Opium is found of incalculable benefit in removing false pains, and is eminently useful in those cases where the membranes have ruptured early —where the uterus is acting strongly and powerfully—where it is urging the head of the child against its undilated mouth; causing excessive agony; inducing irritability, fever, and nervous excitement; and producing no effect equivalent to the suffering endured. In such a case, if sleep can be obtained, an opportunity of recovery is afforded to the system; and the woman gains strength to enable her to bear up against the fatigue necessarily attendant on such great exertion; besides which, during the time of inaction a favourable change may have taken place in the os uteri, predisposing it to dilate more kindly when the pains return. On both these accounts, then, opiate injections are useful when the pains are violent and irritating, and not producing advantage equivalent to the suffering they bring with them; they procure rest and ease for a certain period; and, in the interval of action, they afford an opportunity to the os uteri to take on itself a more kind and favourable state. I am perfectly satisfied that opium possesses no positive power to relax a rigid os uteri,† and that its virtues are entirely centred in its capability of moderating excessive action. The danger of opiates exhibited under labour is, that the uterine contractions may be so entirely removed through their ageney, as never again to be established; and thus the case may be converted into one requiring the use of instruments—perhaps even of a destructive kind.

An infusion of tobacco, in enema, has also been suggested in rigidity: and Dewees‡ has related a case in which two clysters were injected, with the view of relaxing a vaginal cicatrix, an interval of an hour and a half intervening between their administration; but the alarming symptoms which supervened, prove the danger attendant on their use. This herb is very efficacious in reducing irregular spasm, and relaxing muscular fibre;

* Hamilton's Observations, p. 137.

† Dewees, in his Essay on Facilitating certain Cases of Difficult Parturition, p. 84. advances the same opinion regarding the inefficacy of opium as a *relaxing* agent.

‡ System of Midwifery, p. 379.

but independently of its dangerous character, it is of no avail in rendering the os uteri more supple: nor, indeed, should we, *à priori*, expect such an effect from its application; for the difficulty experienced does not arise from accidental spasm, or irregular fibrous contraction; but depends upon an originally firm, hard, rigid, and unyielding texture.

Common domestic clysters are most useful and valuable assistants under all cases of rigidity, both of the os uteri and vagina. They are serviceable by clearing the bowels, by acting as an internal fomentation, and also by amusing the patient's mind. By having recourse to such harmless means, we give her reason to think that she is not neglected, but that all is being done for her relief which art can accomplish: and thus both hope and confidence are inspired, and time is also gained for a full and fair trial of nature's powers; which negative virtue, indeed, is of equal, or perhaps greater advantage, than any of the more positively useful attributes of these applications.

Substances have been applied to the mouth of the womb itself, with a view to relax it: and belladonna has been recommended for this purpose; in London, by Conquest;* and in France, by Chaussier, Velpeau, and La Chapelle; but this practice has not met with the general sanction of the profession in this country. It is recommended that one or two drachms of the extract undiluted be rubbed on the os uteri; or it may be mixed with lard in various proportions.

The knowledge of the extraordinary powers which this drug possesses in relieving pain by paralyzing nervous excitability, and overcoming tonic spasm, led to its employment in this species of agonizing labour; but it seems to have no effect in producing relaxation of the os uteri; and if no good result from its use, it must be injurious;—not in consequence of the poisonous quality resident in the drug itself, but from the friction which is necessary for its efficient application. The mucus that naturally lubricates the part must be wiped away, and this irritation must predispose the tender organ to take upon itself inflammatory action.

It is the custom, also, in France, to inject mucilaginous fluids, as recommended by Gardien,† and warm oil, into the vagina, for the purpose of softening the os uteri, and giving an extra degree of lubrication. I do not see the slightest objection to this practice, and in some instances it may be desirable and beneficial. Two or three syringes full might be thrown up once in every hour.

The warm bath has been suggested, and a trial made of its effect, by

* Conquest's Outlines, 6th edit. p. 82.

† Traité d' Accouchemens, vol. ii. p. 271, 1807.

Dewees;* but it is inconvenient in its use; it is not generally at hand; it tends to weaken the system, and is of no service in relaxing the part: it cannot, however, do much injury, unless indeed it may produce hæmorrhage, (as it seemed to have done in one of the cases cited by Dewees,) and perhaps, in some very rare instances, it might be of benefit, especially if there were preternatural heat and dryness of the skin. External warmth applied to the vulva, as in cases of rigidity of the vagina and perineum, will occasionally be desirable; but its relaxing effect on the os uteri is very questionable.

Under a state of preternatural rigidity of the os uteri, it not unfrequently happens that, without any apparent cause, and independently of any means being used, sudden relaxation takes place; and from that time the labour progresses with much greater rapidity. This favourable alteration in the condition of the organ is generally accompanied by sickness; and I always hail an attack of vomiting under such circumstances, provided there be no symptoms of exhaustion present, as the harbinger of a fortunate change. Emetics have been recommended for the purpose of facilitating the dilatation of the uterine mouth, under the erroneous idea that the vomiting was the cause of the softening observed; but artificial vomiting, induced with this view, has disappointed the expectations of its advocates.† Antimony, nevertheless, in doses sufficient to keep up a feeling of nausea, has been exhibited in these cases with marked advantage.

Under rigidity of the os uteri, the forceps can never be available. Unless this organ, indeed, is entirely, or almost entirely dilated, neither the long nor the short forceps can be used. I am not prepared to assert, that in some rare instances of rigidity the head may not require to be opened: it is seldom, however, that such an extreme case exists; for in time the organ usually gives way. When this condition of the os uteri is the sole cause of delay, we should wait until the last moment consistent

* Essay on Difficult Parturition, p. 87.

† Riverius, two centuries ago, remarked on the practice of giving emetics to facilitate uterine dilatation; and Lowder said, "he had often known spontaneous vomiting do good, but had seldom found benefit from the exhibition of emetics, though he had frequently seen them used." The most disgusting substances in nature have been advised, at different times, to expedite parturition. Thus Hartman (Opera folio, p. 72) tell us "Apud pauperes vidi sæpè partum difficilem solvi haustu urinæ mariti. Sic stercus equinum in vino expressum et percolatum, subitò fœtum et secundas expellit." A midwife also, named Sarah Stone, who published some cases in 1737, gives several instances in which women in labour were made to drink their husbands' urine. Merriman—Synopsis, p. 30—who quotes these passages—remarks, "If such horrible messes were ever serviceable, it was probably by inducing nausea and vomiting." Perhaps the effect on the mind, arising from the confidence with which they were advised, might also have had some influence.

with the probability of the woman's ultimate recovery, before we think of destroying the child's life.

Generally, in cases where the os uteri is rigid, it is found high, at the brim of the pelvis, or in its natural situation; but at other times the head of the child has descended into the pelvic cavity, covered by the thin expanded cervix; and the mouth of the womb is comparatively low, looking back towards the coccyx or sacrum. Such a case may be the occasion of much error and disappointment, unless it be clearly detected: for, on passing the finger for the purpose of making an examination, the tumour caused by the head will be distinctly felt occupying the pelvic cavity; and if the examination be carelessly conducted, or the possibility of the occurrence did not offer itself to our mind, we might suppose that the child would be born immediately. If we form an opinion to that effect, however, in such a case, we shall be greatly deceived; for many hours of wearying pain must be experienced before the os uteri will dilate in a sufficient degree to allow the transit of the head. The sensation communicated to the finger by the tumour itself will sufficiently indicate the nature of the case. Instead of feeling the denuded hairy scalp, we detect a smooth, polished surface; sensible—perhaps acutely so—to the touch; neither suture nor fontanelle will be distinguishable; and, on carrying the finger back towards the sacrum or coccyx, we shall find the os uteri opened not more than to the size of a sixpence or shilling; and through its orifice the head will be clearly perceptible. From the sensibility of the structure, then against which the finger is pressed, the smoothness of its surface, the indistinctness of the sutures or fontanelles, the absence of hair, and the aperture distinguishable at the posterior part of the tumour, that fills the pelvis, we may know that the head has not cleared the uterus, but that it has come down covered by the thinned neck.

Rigidity of the Vagina and Perineum.—The vagina and perineum are sometimes so rigid as to prevent the exit of the child; with this there often exists also rigidity of the sacro-ischiatic and coccygeal ligaments, which adds much to the difficulty of the case.

This state much more usually occurs with first than subsequent children; indeed, simple rigidity of the vagina and perineum, when the patient has borne a family, is very rare. Sometimes, rigidity of these organs singly may be the cause of delay; but it is much more frequently combined with the same condition of the os uteri.

Diagnosis.—There is little difficulty in detecting the existence of rigidity in the vagina and perineum; we may ascertain it by the firmness, dryness, narrowness, and want of distensibility, which characterize the state. The rigidity will sometimes exist to such an extent, that two fingers cannot be passed without difficulty up to the os uteri; and yet, even under this aggra-

vated condition, the parts will most probably, in process of time, become moistened, softened, and distensible; they will eventually dilate, and the case may be naturally terminated. When this unfavourable constitution of the vagina exists, if the os uteri be widely open, and the pains be strong, great pressure will be exerted on the parts within the pelvis, and all the injurious effects of contusion and strangulated vessels may be eminently dreaded.

Treatment.—Here, also, it is our duty to endeavour to relax the rigid structures; with this intention, bleeding has been had recourse to, as liberally and almost as universally as under rigidity of the os uteri itself; but bleeding certainly does not possess the same power in this as in the case last under consideration. I am inclined to limit the use of the lancet to those instances where the rigidity is combined with heat, tumefaction, unusual tenderness, and unnatural dryness,—symptoms which denote that injurious pressure has taken place, and that inflammatory action has commenced. Opiate injections have also been generally adopted; but they seem neither of so much avail as in rigidity of the os uteri, nor indeed are they so much called for; because there is not such distressing pain experienced as when the head is pressing strongly against the hard, undilated os uteri; but if the uterine contractions are exceedingly violent, an opiate enema may prevent laceration. Simple domestic clysters are also of essential service, and may be used in any case.

Warm fomentations are sometimes of great advantage. Flannels may be dipped in hot water, or a decoction of poppy-heads, and applied to the labia externa and perineum. They may be continued, with little intermission, for four or six hours at a time. The warmth is grateful to the patient, and the relaxing influence has sometimes appeared sufficiently evident. Another means of applying warmth externally is by desiring the patient to sit over the steam of hot water, provided she can maintain the sendentary position without great inconvenience: one principal use, however, of these latter means is to gain time, so as to allow the natural powers an opportunity of exerting themselves efficiently, and at the same time to convince the woman that our mind is directed towards affording her relief. Warm oil might be injected into the vagina, if the parts were dry, and harsh, and hot; and if the head were not lying too low to prevent the introduction of the fluid: but, generally, this will not be practicable; and lard will be found a more easy and useful application. The external parts may be lubricated by a little occasionally smeared over them; and a small portion may be carried as high as possible within the vagina, and permitted to melt there. I have often found this cooling application very grateful to the patient; and have fancied that, at the same time, it has tended to produce relaxation. I would, however, caution the student

strongly against unnecessary, meddlesome interference: all *rubbing* must be avoided; and if this lubrication is used at all, it must be in the tenderest and gentlest manner; for much more injury will accrue from denuding the parts of their natural mucus, than good, from the artificial moisture which the unctuous substance affords.*

It is impossible to paint in too vivid terms the dangers that may follow the use of the ergot of rye in the cases now treated of. There is scarcely an accident to which the woman in labour is exposed, but may be induced by its injudicious administration. In the two subjoined instances I attributed the mischief that ensued entirely to its employment.†

* Merriman (Synopsis, p. 29,) says, the best method of using unctuous applications in these cases is to introduce a ball of fine tallow, about the size of a nutmeg, high up by the side of the head, and leave it to dissolve and diffuse itself over the vagina. Thatcher (MS. Lect. 1820) prefers a liberal application of fresh butter, which, as being of greater consistence than lard, is more manageable.

† Late one evening, in the year 1829, after a very fatiguing day, I received a message from a midwife, requesting my attendance on a patient in labour of her tenth child. I was informed that the membranes had been ruptured more than twenty-four hours,—that the breech was in the pelvis,—that the uterus had acted very feebly from the commencement of the labour, but particularly so since the discharge of the waters, and that the whole cause of delay seemed to be an insufficiency of pains. I directed an old and intelligent pupil, at that time resident in my house, to accompany the messenger, to take with him some ergot, and to exhibit it, if he thought the case fitted for its use. He gave half a drachm, infused, immediately, and another dose of equal strength half an hour after. Ten minutes had scarcely elapsed from the administration of the second quantity, when the uterus began to act most powerfully; in ten minutes more the child was born,—wholly without artificial assistance,—and the placenta passed quickly, with very slight discharge. He returned quite delighted with the powers of the drug. Early in the morning, however, I received a second summons, stating that the patient had experienced violent pains all night, had lost a large quantity of blood, and appeared very ill. On my arrival I found her recovering from a state of faintness, and complaining of acute suffering at the lower part of the person. She had sustained a copious discharge of blood, as was evidenced by the appearance of the room; for a large quantity had soaked through the bed, and lay in a pool upon the floor. On placing my hand on the uterus, I found it exceedingly well contracted, hard, and by no means tender; and it was plain that the hæmorrhage had not proceeded from that organ. Examining farther, I discovered that the right labium was very much distended, and painful on pressure being applied. There was, indeed, a longitudinal laceration just within, extending the whole length of the labium; and the cellular structure of the part was filled with a very firm coagulum. On the removal of the clot, an oozing of arterial blood was perceptible, which, however, was restrained by the use of pressure and other means. An opiate procured sleep. In a few days healthy granulations made their appearance; in little more than a fortnight the cavity was quite filled up, and a permanent cicatrix of about two inches in length showed the situation and extent of the injury.

At a later date, I was called, in consultation, to a case in which the uterus had ruptured after the exhibition of a dose of ergot. The accident might certainly have occurred had this drug not have been given, but I had good reason to believe the medicine had mainly contributed to the lamentable catastrophe; there was a slightly distorted pelvis. I have known also some other cases of a similar nature.—Such are the dangers likely to arise from the administration of the ergot in cases unfitted for its use.

It is a very common practice with attendants, in lingering labour, to excite the patient to take stimulants, under the idea that her strength must be very much exhausted, and that some extraordinary means are required to sustain her. No custom can be more injudicious. Even in common cases great danger must spring from its adoption; but it is particularly to be deprecated where rigidity is the cause of delay: for, by increasing the power of the uterine contractions, stimulants will have the effect of forcing the head strongly against structures unprepared to admit it, and,—independently of inducing fever and premature exhaustion,—may occasion laceration of the organs which refuse to yield. For the same reasons, all voluntary efforts on the part of the patient must be restrained as much as possible; and—if from ignorance or obstinacy, her officious friends persist in urging her to call those powers which are under her control, to the assistance of the uterine energies,—the injurious tendency of this advice must be candidly and plainly pointed out.

When the head presses on the perineum, the extended structures must be supported constantly and anxiously, lest they should rupture: the more rigid the parts are, indeed, the greater must be our assiduity: and this is occasionally a most distressing and irksome duty.*

5th. Cicatrix in the Vagina.—A cicatrix in the vagina, the result of sloughing under a previous protracted labour, will occasionally be found to impede delivery. When the healing process is established in the ulcer, which is left on the separation of the slough, a puckering of the vaginal membrane takes place; the surface is diminished in extent, and consequently the diameter of the canal is lessened. In proportion to the extent of the slough, in general will the difficulty be. The history of the case will be in itself almost sufficient to enable us to judge of the nature of the impediment. We shall find that the patient will have suffered one or more lingering, and probably instrumental labours; that symptoms of inflammation of the vagina occurred after one of the deliveries, and that her convalescence was protracted. On making an examination, we shall detect, at some portion of the vaginal surface, a fibrous, unyielding band, preventing the passage of the head. The edge of this band may be as thin as paper, or it may run up for a quarter or half an inch in length, narrowing the canal to that extent longitudinally.

Treatment.—It is very possible that nature unaided will overcome the difficulty offered by a cicatrix in the vagina; and it would, therefore, become our duty to wait a moderate time, that we may give her an

* Hamilton (Practical Observations, p. 155) says he has often had occasion to make counter-pressure from five to nine hours; and at p. 120 he states that he once supported the perineum, without leaving the patient for a moment, for twelve hours.

opportunity of surmounting the impediment. Either relaxation may occur to such a degree as to allow the child to pass, or the fibrous band may lacerate under the strength of the contractile powers. Should the desirable softening, however, not take place,—rather than run the risk of extensive contusions, by the continued residence of the head in the pelvic cavity—rather than have recourse to forcible attempts to deliver by the forceps,—it would be right to enlarge the passage artificially. Four slight incisions may be made into the edge of the constricted part: one towards each sacro-iliac symphysis, and one behind each groin, avoiding particularly the neck of the bladder, the rectum, and the uterine arteries which run up from below, one on each side the vagina. If four incisions be made, the least snip that can be formed will usually be sufficient; for it is more than probable that the aperture will be widened by laceration: and I am inclined to think this would be preferable to making an extensive cut, because of the danger we incur of wounding, not only the rectum or bladder, but also some of the large vessels with which the vagina is so liberally supplied. It would afterwards become a subject of consideration, whether the case should be left to the natural powers, or whether instrumental means should be resorted to, to terminate the labour. The answer to such a question must entirely depend upon the peculiar circumstances attendant on each case. After delivery, when the healing process begins to be established, care must be taken that a diminution in the capacity of the canal to any considerable extent does not again occur; and this would be best prevented by the introduction of a piece of sponge, dipped in oil, to act as a tent, and preserve the vaginal parietes distended. This should be changed two or three times a day, and its use persevered in for some time.

Notwithstanding the high authority of Dr. Dewees, I should by no means trust implicitly to the abstraction of blood, for the purpose of procuring relaxation of the cicatrized and constricted membrane. The American practitioners, indeed, are in the habit of carrying depletion, with this intent, to a degree which we seldom hear of in England. Dewees has given three cases, in which he attributes the relaxation of the cicatrix entirely to this means. In one of these instances, however, between sixty-five and seventy ounces were drawn at two bleedings; and another of his patients lost upwards of two quarts of blood at one operation, through the agency of the lancet, after a previous bleeding to the amount of twelve or fourteen ounces,—a quantity, the abstraction of which few women in this part of the world would bear.*

Unruptured hymen.—Impregnation has occasionally been effected

* System of Midwifery, p. 376.

although the hymen has never been broken; and if this membrane remained entire till the period of labour, it would form a greater or less impediment to the passage of the child. I have been consulted in one case of this description, and another has come under my father's personal observation. Such a cause of protraction must of course be met with in a first labour; and by this circumstance it could be discriminated from a cicatrix, the result of previous sloughing. Its situation would be just at the vaginal entrance, and its form would also assist us in determining its nature. The aperture must be dilated, if possible, by mechanical means; and if that cannot be effected, the case must be treated in every respect upon the principles just laid down for the management of a cicatrix.

6*th. Obliquity of the Os Uteri.*—The last cause of delay attributable to the mother is obliquity of the os uteri; and this has been much insisted on by some continental writers.* It is certainly true, that when a woman has borne a large family, the abdominal muscles become relaxed, lose their tone, and cease to afford that support which the gravid uterus ought to derive from them: the abdomen consequently becomes pendulous; the axis of the uterus, in respect to the person, is changed; its fundus is thrown forwards, and its mouth is directed too much backwards against the sacrum. The upper part of the uterus has also been observed to fall to the right or left side, and the mouth to be turned towards the opposite ilium. Under such circumstances, we are recommended to place the patient either on her back, or on the right or the left side, as circumstances may require, in order to admit of the body and fundus of the uterus gravitating in the proper direction. We are also instructed to draw the uterine mouth more into the centre of the pelvis, by the fingers hooked within it.†

As far as the change of the woman's posture is concerned, I can have no objection to the treatment; and I would, moreover, endeavour to retain the uterus in the necessary situation, by a bandage girt with moderate pressure round the person: but I am decidedly opposed to any forcible attempts being made to drag the os uteri into a more convenient situation; lest it should be lacerated or bruised, or excited to inflammatory action, by the irritation necessarily attendant on our endeavours: and I have at

* Daventer was the first to lay great stress on obliquity of the os uteri as being a very frequent cause of difficult labour. (Midwifery, 3rd edit. pp. 56, 234, &c.) The same idea was taken up about the same time by Peu, (Pratique des Accouchemens, p. 582, et seq.) and has been adopted by Levret, (l'Art des Accouchemens, par. 637, &c.) by Roederer, (Elem. des Accouchemens, par. 449,) and, in a modified degree, by Baudelocque, (par. 272, et seq.) and other French authors.

† Baudelocque, (par. 298,) Velpeau, (edit. Brux. p. 365,) and others, recommend that the os uteri should be brought over the centre of the pelvic brim by means of the fingers.

best very little faith in obliquity of the os uteri producing serious protraction, unless indeed there be present also more or less rigidity, or some disproportion between the pelvis and head.*

II. Causes referable to the Ovum.

1*st. Preternatural toughness of the membranes* is by no means a very frequent cause of lingering labour; nor is it difficult to overcome, when clearly distinguished: it is, indeed, by far more common for a premature rupture of the membranous cyst to produce a protraction of the process; since the passages are then deprived of the advantage of that soft dilating medium, which it offers when entire. If, however, the membranes be exceedingly strong, as occasionally they are,—although possessing their usual thinness and pellucidity,—it is evident that the very circumstance of the bag remaining whole after the full dilatation of the parts is effected, will necessarily more or less prolong the labour; since the ovum must either pass unbroken, or a greater force than ordinary must be exerted by the uterus to destroy its integrity. It is not to be expected that the ovum will be expelled whole, provided the term of gestation be nearly perfected; nor, indeed, is such an event desirable, because of the dangers which must accrue both to the mother and the fœtus;—to the mother, in consequence of the great probability of hæmorrhage from the sudden emptying of the uterine cavity of all its contents at once;—to the fœtus, from its being deprived of the means of life through the placental circulation, before it can enjoy the equivalent advantage of respiration.

I have already laid it down as a principle, that in ordinary cases, so far from desiring the early rupture of the membranes, we should be anxious to preserve them as long as possible;—until, indeed, the os uteri is perfectly opened, the vagina distended, and they have protruded somewhat externally. As soon, however, as they have appeared in the least outward to the vulva, we may suppose that all the advantage which can be derived from them has been gained; and, should they still resist the power of the uterine contractions, we may conclude that their preternatural toughness is retarding the exit of the head.

Treatment.—In this simple case it is only necessary to perforate the bag with the finger-nail, a pointed quill, or a stilette: the waters will escape; the head of the child will then enter the pelvis, if it has not previously done so; and—provided this be the sole cause of delay—the difficulty will immediately vanish.

* See William Hunter's Anat. of Gravid Ut. p. 10; Denman's Introduct, to Mid. chap. x. sect. 5, art. 4; and Davis's Principles of Obstetric Med. p. 979.

2d. *Head preternaturally enlarged.*—The second cause referable to the ovum is a preternaturally large head, either from healthy formation, monstrosity, or disease. It has been already stated,* that the size and weight of infants at birth vary exceedingly;—that three instances are recorded, where the child weighed considerably above sixteen pounds; and we may naturally conclude, that when the general bulk so prodigiously exceeds the common average, the head will partake of the exuberant growth, and occasion a proportionate difficulty under labour.

In such a case it is probable that the true cause of protraction will not be discovered until the head have entered the pelvis, or engaged somewhat in the superior strait. But its mere extraordinary size would not influence our treatment, or abrogate the general rule—that we should desist from interfering instrumentally, until symptoms supervened indicative of distress, and requiring relief.

Rare as the last cause of protraction must necessarily be, it is still more uncommon for a monstrous formation of the head to impede its transit: the most usual irregularity in development is a want of brain; and, as in this case, the head is smaller than ordinary, such a mal-formation can in no degree interfere with its easy descent. But children are occasionally born with tumours attached to the cranium.† These usually contain fluid, and, however large they may be, from their compressibility they would offer but little resistance to the accomplishment of the process of parturition. A collection of water within the fœtal skull itself—constituting congenital hydrocephalus—is a less frequent disease; though this is also very rare. It has been my lot, however, to meet with such an enlargement on many occasions. The quantity of fluid effused is sometimes almost incredible; three and four pints have been contained, together with the brain, within the skull.‡ Yet although the relative proportion between the head and pelvis, necessary for the child's easy passage, does not exist; and the difficulty and danger must be in proportion to the dimensions the

* See page 86. To the instances already mentioned, may be added that of a fœtus preserved in the Museum of the Royal College of Surgeons in this city, which is said to weigh eighteen pounds. The portion of navel string attached to the umbilicus proves that the child could not have long survived its birth. It is stated, indeed, to have died in its passage.

† See Perfect's 117th case. There is a preparation in the London Hospital Museum, where a tumour of hernial character is attached to the vertex of an infant, more than half the size of the head.

‡ In my father's sixty-eighth and sixty-ninth cases, (Practical Observations, Part I.) he supposed each cranium to have held many pints of fluid. In Smellie's case first, collection thirty-one, (Cases in Midwifery,) three pints were collected on the cranium being punctured; and in case twenty, collection thirty-five, between two and three pints of water were poured into the skull after the child's extraction, through the opening by which the hydrocephalic fluid was evacuated. In Perfect's last case, the head, extracted whole, the breech having originally presented, measured twenty-four inches and one-eighth in circumference.

head has acquired; it does not follow as a matter of course that the woman would die undelivered, if art does not step in to rescue her: for I myself witnessed a case immediately after its termination, in which a head, containing a pint of fluid, was squeezed whole through the pelvis, to the great danger of the sacro-iliac ligaments and the pelvic contents.* In two other instances that came within my knowledge, where putrefaction had occurred to a considerable extent, the scalp burst, and the fluid was evacuated: the bones then collapsed, the difficulty was over, and the flattened head protruded. But in other cases,—and they are by far the most frequent,—instrumental aid will be found necessary before delivery can be effected.

There is great danger in allowing a dropsical head to remain for a long time locked in the pelvic cavity; because, from its compressibility and the open state of the fontanelles, it so completely adapts itself to the shape, and moulds itself into the irregularities of the cavity, as to occasion strong, uninterrupted, and almost universal pressure upon the lining structures, to their imminent and certain hazard. We should naturally expect sloughing to occur: the bladder and the rectum might be implicated, and a fatal termination result.

Diagnosis.—Such being the dangers attendant on this case, it becomes a matter of the greatest possible consequence, that we should detect a hydrocephalic head as early in the process as possible: nor is the diagnosis generally difficult. We may ascertain the existence of the disease by the volume of the head being so much greater than ordinary, by the bones being so much wider apart, the fontanelles and sutures being more open and discernible, and by there being a certain degree of fluctuation evident within the skull. We must not, however, rely implicitly on the last-named symptom; for the pressure which the head is undergoing will very frequently prevent the sensation of fluctuation being communicated to the finger, even through the distended anterior fontanelle. These peculiarities it will certainly not be easy to discriminate before the os uteri is dilated to a moderate extent; or if we are content with inquiring by the first finger of the right hand: but I have before laid it down as a maxim, that we should introduce two or more fingers of the left hand, to deter-

* On arrival I found the woman just delivered of a dead hydrocephalic fœtus, the circumference of whose head was eighteen inches. She suffered acutely after her labour from inflammation of the sacro-iliac ligaments, consequent on the distending pressure, to which they had been subjected from within; and could not walk without support for ten or twelve weeks. This occurred in 1823. In the year 1827 I was called to another patient, who, just before I entered the room, had expelled a hydrocephalic child, after a very severe labour of more than sixty hours' duration. The head measured seventeen inches round; but I was not allowed to ascertain the quantity of fluid it contained. This poor creature died within a week, from the combined effects of exhaustion and inflammatory action.

mine the cause of delay, provided the labour be not progressing satisfactorily; and although the pelvic cavity be but little occupied by the head, we shall in most instances be able, with care and attention, to satisfy ourselves of the true nature of the case.

Treatment.—Having, then, detected a dropsical head either above the brim, or partially occupying the cavity of the pelvis, what must be our practice?—Are we to act on the principles I have before so often enjoined, of waiting as long as possible, compatible with the patient's strength, before affording any means of relief?—Are we to incur the hazard of contusion, inflammation, laceration, and sloughing?—Are we to run the risk of the patient's powers becoming exhausted by useless struggles;—of her system being so much depressed as to endanger her sinking?—I would reply to these queries by a decided negative.—When we have ascertained that nature is unable to overcome the difficulty except at a great expenditure of power, conjoined with imminent risk of the woman's life, we are fully warranted in having recourse to perforation more early than if the child were healthy, that the fluid may be evacuated, and an opportunity afforded to the bones to collapse; the case will then most probably be terminated by the contractions of the uterus alone. I think myself justified in offering this recommendation, because of the danger of inflammation, and all the dreadful consequences which may follow impaction of the head, and because of the slight probability there exists of the ultimate preservation of the child's life. Suppose even that the infant was born living, is it likely to survive for any length of time?—Is it probable that the disease, originating in an early period of pregnancy, will be removed, or even suspended?—Are we not rather to expect that it will go on increasing, to the ultimate destruction of the little sufferer?—Is the child, then, likely to be a comfort to its parents?—Is it likely ever to enjoy the perfect possession of its faculties, whether corporeal or intellectual?—Is it likely to become a useful citizen, or valuable member of society?—The probability is much against even the least of these advantages.—Can we, then, for a moment put the woman's safety in competition with the preservation of a hydrocephalic child?—If it be objected that life must necessarily be destroyed by adopting the measures just recommended, and that it is the duty of the physician to preserve life, if possible, under the most aggravated circumstances of pain, misery, helplessness, and fatuity, I would acknowledge the obligation on the part of the medical practitioner to the fullest extent; but I would also remark that here is life at issue against life;—the life of the mother of a family, in other respects healthy, against the puny, slender, scarce animal vitality of an infant diseased beyond the hope of surviving, and with little chance of enjoying even the faintest gleam of intellect. But granting that the child should pass alive, and the wo-

man also be preserved, her structures must be seriously endangered; and two miserable instances of sloughing, when the head was full of serous fluid, have come under my own immediate notice, occasioned by the praiseworthy—though in the case under consideration, falsely-founded—horror inspired by the idea of craniotomy. In following up this practice, however, let us beware of error:—let not our ignorance lull us into a fatal assurance. Let us be *perfectly certain* of the existence of disease in the fœtal head before we take the perforator in hand.—What an appalling and sickening feeling must overspread the mind of that man who plunges the murderous instrument into the centre of the brain of a living, healthy fœtus, under the erroneous belief in the presence of hydrocephalus! What would his sensations be, when, instead of the expected water, a stream of pure and unmixed blood flows from the inflicted wound! What bitter remorse must overwhelm him, when, after the keenness of the first shock has passed away, leisure is afforded him to contemplate the rashness and criminality of his conduct!—The mischief is done;—the death-blow is struck;—the act is irrevocable!*

Fig. 96, Plate XXXII., shows a hydrocephalic head, which contained about twenty-four ounces of fluid, filling up the brim of a skeleton pelvis. Fig. 95 is a front view of the same head. It is impossible to regard these drawings, without being impressed with the cruelty we should be guilty of, were we, with a knowledge of the existence of the disease, to permit a dropsical head to remain for any length of time either impacted in the pelvic brim, or wedged in the cavity.

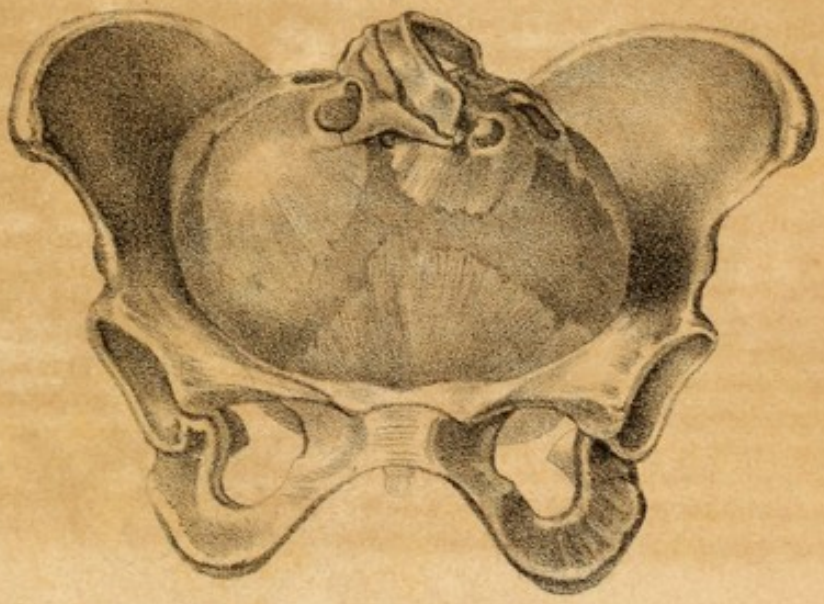
3d, & 4th. Unusual firmness, and malposition of the head.—As occasional-

* See an instructive case of labour, complicated with a hydrocephalous fœtus, in the Medical Gazette, July 3rd, 1840, communicated by Mr. Robertson, of Aberdeen. In this instance the woman died forty-five hours after delivery of her eighth child, from the effects of pressure occasioned by the head, which contained four pints of water, on the organs situate at the pelvic brim. The last patient I delivered of a hydrocephalic child (May 29th, 1840) had been in labour from Sunday, when the membranes broke, to early on Friday morning, when I first saw her. It was her second child; her first labour had been easy. The medical gentleman in attendance, hoping and expecting hour by hour that the case would soon be terminated, did not send for me till pressing symptoms of exhaustion had supervened. She did not rally in any considerable degree from the depression under which she was delivered, and died the same evening. This head contained nearly two pints of water. Most of the cases of this description which I have seen have been attended with great agony, especially in the pubic region, from the time the liquor amnii was evacuated till delivery, and some of them even before the membranes broke; and the patient, as in Mr. Robertson's case, has been exceedingly irritable and restless, rolling about in every direction, and with difficulty preserved in one position a sufficient time to make the necessary vaginal examination. This aggravation of suffering arises from the pressure of the distended cranium on the bladder and other tender structures at the pelvic brim, which, in cases of ordinary labour, are not subjected to the same distress.

Fig. 95.



Fig. 96.



Sinclair's Lith.

The case would be known by the shoulders remaining at the outlet of the pelvis after the birth of the head, resisting both the expulsive powers exerted by the uterus, and the extractive efforts of the medical attendant. On the hand being passed into the pelvis, along the body of the child anteriorly, it would detect the abdomen, large and distended, soft and fluctuating, entirely blocking up the pelvic brim, and more or less filling the cavity.

If our endeavours to perfect the birth by traction at the neck, or by hooking the finger or some blunt instrument under the axillæ, were not crowned with success, we should be compelled to diminish the bulk of the body, by puncturing the abdominal parietes, and evacuating the contained fluid. This could easily be effected by a trochar, or even by the obstetric perforator. The only objection which could be started to the performance of this operation, consists in its apparent cruelty; but every consideration must give way to the preservation of the woman's life; and we shall mostly find, that the child has ceased to exist before this means of delivery has become necessary. Unless it be breathing vigorously, the pressure exerted on the umbilical cord will most likely have destroyed it; and that pressure must have been carried to a great extent, if we are unable to withdraw the body without making an opening into the peritoneal sac.

Tympanites is the effect of putrefaction; and gas may be generated in the abdominal cavity, in the intestinal canal itself, and in the cellular structure underneath the skin.

We can have no difficulty in determining that putrefaction has occurred, after the head is born; the cuticle will desquamate most easily, and the scalp itself will be emphysematous. If, under this state of things, difficulty occur in the passage of the shoulders, we can be at little loss to understand the cause; and should we be disappointed in our attempts to liberate the infant by the finger, or blunt hook passed around the shoulder, we must here also perforate the abdomen, let out the air, and give an opportunity for the body to collapse. The diminution in bulk will then readily allow its extraction. When putrefaction has taken place, we cannot hesitate to operate in the manner recommended; for the child being certainly dead, no additional injury can be inflicted on its person.

6*th. Shortness of the Funis Umbilicalis* has been regarded as another cause of lingering labour attributable to the ovum. It has been already shown that the umbilical cord varies to a very extraordinary degree, both in length and thickness, but particularly in length; so that it sometimes measures five or six feet, and in other cases it has been known scarcely to exceed six inches. Presuming that it is not more than a few inches in

length, that circumstance alone has been supposed sufficient to prevent the ready passage of the head. This was particularly the opinion of the ancients, who considered that the child by its own efforts assisted greatly in liberating itself from the uterine cavity; and that these efforts would be frustrated and rendered of no avail, by its being tethered, as it were, to the uterus, and on that account incapable of effecting its extrication. I have, I trust, satisfactorily proved that the child is a perfectly passive body under labour; that no exertions of its own facilitate its escape; and therefore this reasoning must fall to the ground. Under the action of its fibres, the fundus uteri descends, and follows, as it were, the child's body; there is, therefore, always nearly the same distance between the umbilicus of the child and the placenta,—even though that organ be attached high up within the womb,—whether the uterus be perfectly quiescent, or whether it be acting vigorously. So far, then, as the head of the child is concerned, the shortness of the funis umbilicalis can produce no such impediment to its exit as to cause a lingering labour.

But the case is different when the head has passed, and the shoulders are about to escape; then, if the funis umbilicalis be preternaturally short, or rendered so by being twisted round the body or limbs of the fœtus, a difficulty in the expulsion of the shoulders may be experienced, or dangerous consequences may be produced;—the placenta may be prematurely separated from its attachment, or its mass may be broken; a portion may be expelled, and the remainder, retained in utero, may give rise to violent hæmorrhage.

Diagnosis.—We may suspect that a preternatural shortness of the cord impedes the passage of the shoulders, provided we find, after the head is born, that the body of the child does not advance, although the uterus continues to act strongly; that no preternatural enlargement of bulk exists; and if on passing our finger up to the umbilicus, and endeavouring to pull down a loop of the cord, we find it tense and tight, resisting all our efforts to withdraw it.

Treatment.—In a case of this kind it would be right not to hurry the extraction of the child, provided it be breathing freely; but to obtain all the advantage derivable from the contraction of the uterus. By this means we shall best avoid the risk both of immediate and eventual hæmorrhage: for as the uterus contracts more perfectly, the body will be expelled, and the placenta will most probably be separated at the same time. A similar impediment may be produced, if the funis be coiled around the child's neck. I have already adverted to the possibility of this occurrence, the accidents it may occasion, and the mode of preventing them.*

* Page 131.

7th. Unusual bulk of the trunk or limbs from excessive development.—We sometimes, though rarely, find that the different fœtal members do not grow in their just proportion, but that some are deficient, while others are abundant in development. Preserved in the London Hospital Museum there is a fœtus measuring in length twenty-four inches, whose shoulders are seven inches across, (the average width being under five;) while the cranium is smaller than ordinary. Such a prodigious bulk would necessarily occasion difficulty after the head had passed; and the case must be met by the common means. Taking especial care, if the child be alive, not to injure the arm or the shoulder-joint, the finger, the corner of a handkerchief, or a blunt hook, must be insinuated first under one axilla, then under the other, traction may be made by these agents; and by perseverance our object will generally be effected: for the compressibility of the viscera, and the elasticity of the thoracic parietes, are fortunately so considerable, as to allow a great diminution in capacity, and permit the extraction of the body through a comparatively narrow channel. In making such efforts, however, we must bear in mind the delicacy of the structures on which our purchase is fixed: we may break the humerus, separate the epiphysis, or dislocate the head of the bone,—accidents all of serious consequence,—unless we use the power we are in possession of with the utmost tenderness.

8th. Monstrosity.—It may be our fortune to meet with other more rare and more complicated species of monstrosity. Plate LI. figs. 140 and 141 delineate two specimens of double fœtus,* both having arrived at the full period of intra-uterine maturity;—the first, two perfect children joined together from the upper edge of the sternum to the pubes,—each possessing a head and proper complement of limbs;—in the second, the individuals are attached to each other by the side of their trunks; and the two heads are appended to a body double at the upper part, and single below, there being four arms but only two legs. The difficulty and danger attendant on such a birth must be great, and will come under consideration at a future opportunity.

All these causes, then, may operate to induce a lingering labour; some of them very much impeding the expulsion of the head, and others the passage of body when the head is born. But the case may be complicated with still greater difficulties than have been described, by two or more of the causes enumerated, acting in concert. Thus, an unfavourable position of the head may exist, in concurrence with atony of the uterus,

* In the collection at the London Hospital.

or rigidity of parts; or all three with a diminished capacity in the pelvic apertures.—*See Complex Labours.—Monsters.*

THE MANAGEMENT OF A PATIENT UNDER LINGERING LABOUR requires to be even more strictly regarded, than in a natural and common case; because her present comfort and future welfare depend much, as well on our own conduct, as on the rules we lay down for her guidance.

The chamber should be preserved cool and quiet, to avert fever and entice sleep. It is highly necessary that she should not be kept in one posture, because of the inconvenience, the irksomeness, and additional distress a constrained position must occasion. She may stand, walk, or lie, alternately,—especially during the first stage,—or place herself in any situation under which she is least uneasy. We must, by every persuasive argument, prevent her from bearing down, or using any voluntary efforts, for the purpose of aiding the action of the uterus. The attendants in the lying-in room often suppose that, when a certain number of hours have elapsed since the commencement of labour, a proportionate progress must necessarily have taken place; and accordingly, with the best intentions, they are constantly urging the patient to exert those powers which are under the influence of her own will, in the belief that such exertions will facilitate the child's birth.

After what has been advanced, it is scarcely necessary to revert to the uselessness and danger of this untimely exercise of the assistant muscles: not only may the strength be prematurely expended, which should be husbanded for a future period; but injury may arise from the too forcible propulsion of the head against the undilated and unprepared passages.

Nor must we think it immaterial to regulate the diet. I have already said that solid food should not be allowed under labour,—and this observation holds good, particularly with regard to a protracted state,—because the nervous energy being principally directed into other channels, digestion goes on but imperfectly. For reasons, also, before given, stimulants should be avoided: nourishing fluids may be taken *ad libitum*, and the blandest are generally the most desired.

A great objection is made to the exhibition of cold, and especially acidulated drinks, under lingering labour; on what grounds I cannot understand; and therefore I would by no means interdict them, if they are grateful and palatable. Effervescent draughts, and the subacid fruits, will often be found highly refreshing.

With regard to our own conduct, for the reasons before mentioned, we must abstain from frequent examinations, and from close attendance at the bed-side of the patient. By too great assiduousness during the first stage,

we shall either impress her mind with injurious anxiety, or induce her to believe that the labour is on the point of being completed; and we shall perhaps be adding disappointment to bodily suffering. We must not be carried away by her calls for "help," however importunate she may be; but reason calmly with her, and assure her that, when the period arrives at which our assistance can be useful, our best endeavours shall be exerted to mitigate her sufferings. We must speak cheerfully both to her, and in her presence; and endeavour to preserve not only her confidence, but her spirits: for the feelings and passions exert a most powerful influence over the progress even of natural labour.

The most important duty of all, however, which we have to discharge under lingering labour, is carefully to watch the state of the bladder. Every three or four hours we should place our hand on the vesical region, to ascertain whether it has become materially distended. It is less difficult to gain this information during labour than when the uterus is unimpregnated, because, in the latter case, the organ falls lower into the pelvic cavity, and becomes somewhat buried within the surrounding viscera: but when the abdomen is pretty nearly filled by the enlarged uterus, and the pelvic cavity is more or less occupied by the child's head, the bladder cannot retire either backwards or downwards, but is thrown forwards, and become so much the more evident to the hand. In making this examination—the patient lying on her left side—we pass the right hand upon the abdomen; and, presuming the membranes are ruptured, we feel rising, even above the umbilicus, a hard, firm, solid tumour, which is the uterus itself, on which we can make no impression, and which is observed to be sometimes harder and sometimes softer, in proportion as alternate contraction and relaxation take place in its fibres. Beneath this we shall find another tumour, more circumscribed in shape, occupying the hypogastric region, just peeping above the pubes, encroaching more or less on the cavity of the abdomen; varying, therefore, in size, according to the quantity of urine it contains, and giving a certain degree of indistinct fluctuation to the hands,—sufficiently perceptible, however, for us to determine that the tumour is the distended bladder. But we must not suppose that in all cases we shall feel the bladder, although it contain a considerable quantity of fluid, distinctly evident in its usual situation; because it may have subsided to the right or left side, and, instead of being found in the centre of the hypogastric region, it may be on one side of the enlarged uterus, appearing above one or other groin; or it may have prolapsed before the head of the child, Plate XXXI, fig. 94, as above described, offering itself as a soft tumour in the pelvic cavity. Having our mind, then, directed to such possibilities, we must not at once conclude that it is empty, although it may not be discoverable immediately above the pubes.

It is of the utmost consequence that we should not permit much urine to collect under protracted labour; not only because a distended bladder both adds greatly to the suffering endured, and interferes with the efficient action of the propelling powers, but also because of the danger incurred of injury to its own structure. It may burst,—inflammation may attack its lining membrane, which may terminate in the destruction of its coats; or a fistulous orifice may be formed between its neck and the vaginal canal, which disastrous accident is much more likely to happen under an accumulation of water within its cavity, than if it be kept in a collapsed state.

For information respecting the condition of the bladder, we must depend only on our own personal examination, and not trust to the declarations either of the patient or the nurse. We are often told, in answer to a general question, that the water passes plentifully and freely; but if we are more minute in our inquiries, we find that some fluid dribbles away, as the patient lies, with each return of uterine contraction; and that no voluntary evacuation has taken place for many hours. This fluid may be the liquor amnii, or it may be urine squeezed out of the bladder by the compression exerted on that viscus by the abdominal muscles. In the latter case, it may be known by its urinous odour; and the very circumstance of its being forced out thus involuntarily is a proof of the cavity being over-distended, or at least of its containing a considerable quantity; for if it were entirely, or nearly empty, this dribbling would not occur. So far then from this circumstance satisfying us, it is the surest indication of the necessity of having recourse to artificial evacuation.

The cause of this inability to pass urine under labour will mostly, if not always, be found to consist in the stricture formed at the neck of the bladder, or in the course of the urethra, by the compression those organs suffer between the fœtal head and pelvic bones.

Treatment.—When the bladder requires to be artificially emptied, the catheter must be used; and for this purpose, if the head is occupying any portion of the pelvis, the flat instrument is preferable to one of a round form; because it takes up less room in the antero-posterior direction. The woman need not be removed from the ordinary obstetric position; and the attendant passing the first finger of his left hand between the labia externa will discover the meatus urinarius just within the lower angle of the symphysis pubis, at the extremity of the smooth groove-like passage, named the *vestibule*. Guided by the finger, the point of the catheter is to be insinuated within the meatus, and with great gentleness the instrument is to be slid upwards, until about three-fourths of its length is introduced. To prevent its slipping entirely into the bladder, it should possess a rest or stop near its outer end; such an accident I have known twice happen, where this precaution would have obviated the occurrence.

But it is not always that the meatus urinarius retains either its natural position or its ordinary character and feel; for the urethra being pressed upon by the child's head, its lower aperture is forced downwards; and is thus thrown out of its common situation. If this pressure is continued for any length of time, the meatus and surrounding parts become swollen; and the opening no longer affords those peculiarities to the touch which it possesses in its more natural condition. Under this state of tumefaction and distention, the most inexperienced person may fail to recognise the commencement of the urethra by the finger; and if that be the case, it is far better to submit the patient to an examination by the eye, than to run the risk of the serious and in many instances, irremediable dangers, that attend on a continuance of over-distention. Should much difficulty be experienced in guiding the tube into the bladder, we must on no account endeavour to *force* a passage; but some new direction must be given to the instrument; and if our efforts are still unsuccessful, an elastic catheter must be substituted. The impediment met with to the easy entrance of the catheter may depend on the head being tightly wedged in the pelvic cavity, or it may arise from the urethra being twisted a little to one side, out of its natural straight course. In either instance, if any attempt is made to overcome the resistance by violence, the probability is that the point of the instrument will pass through the back part of the urethra and the coats of the vagina behind it into the vaginal canal, and run up to the os uteri; an accident that has many times come within my knowledge, and which is the more likely to happen, in consequence of the structures having been thinned by pressure, and perhaps having also suffered some softening, the result of incipient inflammation. When this has unfortunately occurred, it may be easily known by the exertion required for the introduction of the instrument; and by some of the fluids which the uterus contained—thick, greenish, or bloody—being evacuated through the tube instead of urine. Mostly nature will repair the inflicted injury after labour, and restore the urethra to a sound state; sometimes, however, a permanent fistula is the consequence.

It is scarcely necessary I should insist on our satisfying ourselves that the catheter is not plugged, or on the propriety of smearing it with some unctuous substance, to facilitate its introduction. A small basin must be at hand to receive the urine as it flows.

Order II.—INSTRUMENTAL LABOUR.

Plates XXXIII., XXXIV., XXXV., XXXVI., XXXVII.

Although in skilful, and especially discriminating hands, obstetric instruments must be regarded as great blessings to the suffering sex, yet it is a question with some practical men, whether by their unnecessary and improper use they have not produced on the whole more injury than good.* During the long reign of barbarous surgery, there is ample evidence to prove that instrumental interference was often most unjustifiably had recourse to; and there is good reason to fear that many women have dragged on a miserable existence to the end of their days, the miserable victims of impatience, ignorance, or violence. There is also the same cause for apprehension that in no few instances, the child's, if not the mother's life, has been sacrificed, when patience, perseverance, and reliance on the natural powers, were the only obstetric auxiliaries required.

I would not have it thought by these observations that I am unable to appreciate the advantages sometimes resulting from instrumental aid; or that I would draw an argument against a valuable measure from the possibility of its abuse. I know too well that nature sometimes fails even in her grandest and proudest work—the continuance of the human species; and that occasionally both the mother and her offspring would be overwhelmed in one common fate, unless art stepped in to snatch them from impending destruction. But I would endeavour deeply to impress upon the mind of the young practitioner that urgent necessity alone will

* See Blundell's Principles by Castle, p. 526.

warrant him in taking an obstetric instrument in hand; and that when a choice is allowed him, he should leave nature to accomplish her own purpose,—provided, indeed, he can with safety trust her.

In his practice he will find it much more difficult to determine the time when instrumental aid may have become necessary, than to administer that aid; and unfortunately, he will find the most deadly means most easy of application. Many times, also, he may be almost persuaded against his own opinion to the adoption of those means by the urgent and unceasing solicitations of his patient. I would entreat him neither to allow these considerations to weigh with his judgment, nor to let that less worthy motive, a wish to take advantage of the *éclat* likely to result from a successful operation, tempt him to act contrary to his own feelings of propriety.

Two species.—I have already arranged instrumental cases under the second order of difficult labours, and have divided that order into two species:

First, those which are accomplished by instruments perfectly compatible both with the life of the child, and the safety and continuity of the mother's structures:

Second, those in which either the child's body must be mutilated, or a cutting operation be performed on the mother's person.

Four kinds of instruments, differing essentially in their fashion and mode of application, have been used to overcome the lesser degrees of difficulty which we meet with; by the employment of either of these, the labour is reduced to one of the first species of this order: they are the long and short forceps, the vectis and the fillet;—the latter means is now most properly discarded from British practice, in cases of head presentation.

The instruments resorted to in the second species of this order of cases are of a cutting character, and they may be resolved into two varieties—the *first*, those which are applied to the child, and are necessary for the performance of craniotomy, as the perforator or craniotomy scissors, the crotchet, the blunt hook, and the craniotomy forceps;—the *second*, those which are applied to the mother's person,—by which the Cæsarean section is performed, or the symphysis pubis divided,—the scalpel, bistoury, and others, which are auxiliary, and sufficiently well known in surgery to require no particular mention here.

FORCEPS.

Among the most ancient writers on medicine and surgery we meet with no description of any obstetrical instrument at all resembling our forceps. Hippocrates,* indeed, and Celsus,† both allude to instruments for the purpose of facilitating difficult labour, but they were of a kind designed merely to extract the child without reference to its life; they consisted entirely of hooks and crotchets; and their use must necessarily have mutilated the fœtal body.

The first gleam of such a contrivance sparkles in the works of Rhazes, the Arabian, who in the latter part of the tenth century, described a fillet supposed to be adapted to this purpose. We find in Avicenna, whose work appeared nearly one hundred years after Rhazes wrote, the obstetric forceps mentioned by name; but whether they were of his own suggestion, or had been in use previously, is by no means clear: it is generally believed, indeed, that he was the original inventor.‡

It does not come within the limits of this work to enter into the *history* of the different powers suited to relieve the exigencies of parturition, a subject curious and interesting, but not involving points of sufficient practical utility to find a place here.§ And I consider it, indeed, of much less importance to discuss the merits of the various alterations which the forceps have undergone, than to obtain a knowledge of the cases requiring their assistance, and the mode in which that assistance should be rendered. I am in the habit of using Denman's straight forceps; and these I recommend to my junior brethren, at least in the commencement of their practice, in preference to those with Levret's, or any other lateral curve, because each blade is, in shape, exactly similar to its fellow; either may be introduced first or uppermost; each becomes a right or a left hand

* Sect. iii. de Superfœtatione. † Lib. vii. cap. 29.

‡ After giving some directions, the application of which it is not very easy to make out, he says, "Liget (obstetrix) fœtum cum margine panni, et trahat eum subtiliter, valdè cum quibusdam attractionibus. Quòd si illud non confert, administrentur *forcipes*, et extrahatur cum eis; si vero non confert illud, extrahatur cum incisione, secundùm quod facile sit, et regatur regimine fœtus mortui."—Opera in Linguam Latinam Redita, lib. iii. cap. 28—Fen. 21, tract 2. In this quotation we have a plain proof that both the fillet and forceps were in use among the Arabians.

§ I would take the liberty of referring those of my readers who are disposed to enter into this question, to some lectures which I delivered at the London Hospital, in the session 1833-34, as published in the Medical Gazette of that time, (vol. xiv. p. 226, et seq.;) and on this particular branch of the subject I can recommend, as an authority, Mulder's very erudite "Historia Forcipum et Vectium."

blade, according as it is adapted to the pelvis; and no thought or calculation is required as to which should be applied over the one or the other side of the fœtal skull;—which consideration in itself is very likely to embarrass a young operator, and may be the occasion of his failure. This instrument measures eleven inches and three-eighths from the extremity of the handle to the tip of the points; of which the blade occupies seven inches, the handle the remainder; the groove for the lock being three-eighths of an inch deep. The greatest width between the blades is about their centre, and measures two inches and seven-eighths; the space between the points is exactly one inch. The fenestra is in the shape of a kite, but considerably longer in proportion to its width: the blade in its widest part, near the extremity, measures an inch and three-quarters across; the extreme width of the fenestra being one inch and three-sixteenths. The blades spring from the locking part in a regular sweep outwards; there being no shank, properly so called. The whole instrument weighs ten ounces and three-quarters. See Plate XXXIII. fig. 97; *a* the instrument closed, *b* the back view of a single blade.

Besides these peculiarities necessary to be attended to in choosing a pair of forceps, there are many others of less apparent moment, which must not be passed over without notice. They should be manufactured of the best tempered metal, else they are liable either to break or bend. The lock should be formed rather loosely, so that when the blades are adjusted one to the other, there should be a slight lateral motion allowed: for the space of at least an inch and a half from the handle, each blade should be of a uniform thickness, that it may be slid to that extent within the groove of its antagonist; for this, we shall find, assists much in its application under labour. No shoulders are admissible near the lock, no ornamental ridges, no serrated edges; every portion of the locking part should be perfectly smooth, and the corners rounded. The external face of each limb of the blade should, of course, be somewhat convex; so, indeed, should the internal also. All the instruments that I have ever seen have a rounded convex external surface, that the parts of the mother may not be injured; but in many the internal surface in contact with the child's face is flat. Every flat surface must have two sharp edges; and if strong pressure be applied, these edges will cut. To obviate the chance of disfigurement to the child, then, the inside of the instrument must be slightly rounded also.

Another point to be attended to is, whether the instrument should be coated. It was the old fashion to cover each blade entirely with leather, that it might be less formidable to the sight; that, in locking it, little noise might be made; and that it might be softer to the woman's person, and therefore not so likely to do injury. Many of the instruments depicted in

Smellie's and other plates are finished in this way. This practice was, in my opinion, objectionable on many grounds. In the first place the leather takes up room, and does not afford strength equivalent to the space it occupies; and we shall find in difficult labour, when disproportion from any cause produces the delay, that it is of consequence to gain even the minutest portion of an inch in space. Again, the instrument does not pass up so easily when covered with leather, as when it is plain and polished. A still greater objection, however, has been urged against this practice, and one that has caused it to be generally abandoned. It has been supposed that infection—the virus of syphilis or gonorrhœa, for example—has been carried from a diseased to a healthy person. If there be the slightest probability of such a sad accident, it would be our bounden duty either to discard the leather entirely, or to change the covering after each time the instruments are used.

The only coating I would admit of is a silver wash: to this there can exist not the slightest objection; and those who are critically particular in regard to the neatness of their instruments, may, without any detriment to their efficacy or value, require them to be disguised under the specious semblance of the precious metals. Practitioners in the East or West Indies, and other warm climates, would do well to incur this additional expense in their obstetric forceps, as well as other surgical instruments, not for the sake of appearance, but to prevent rust.

It must be evident that when the two blades are adapted to each other, so that a compact instrument is formed, it becomes a lever of the first kind—the resistance being at one end, the moving power at the other, and the fulcrum between the two: it is to be observed also, that this fulcrum is situated at the joint; that it is fixed, and its seat cannot be altered; and that, in the action of the instrument, one blade so completely antagonises the other, as to leave but a slight probability of the mother's structures being seriously compressed, provided it be used with caution and tenderness. There is but one modern of repute who has altered the situation of the fulcrum;—I allude to Assalini, so well known by his admirable surgical forceps for the purpose of securing deep-seated arteries. This ingenious surgeon has been by no means so happy in his attempts to improve the obstetric forceps; his fulcrum is at the extremity of the handles, so that a lever of the third species is formed,—the resistance being at one end, the fulcrum at the other, and the moving power in the centre. Everybody acquainted with the rudiments of mechanics must be aware that much power is lost by this contrivance: this objection, however, would be but trivial; for with the common forceps we possess considerably more power than we can generally dare to use. A greater objection would be the chance of causing injurious pressure on the maternal structures, in

working the instrument; and this has deterred me from making a trial of them.

Application of the forceps.—Before the short forceps can be applied, the os uteri must be entirely dilated, and the head must have come down into the pelvis sufficiently low to enable us to feel one or both ears distinctly. The instrument, indeed, can neither be introduced without difficulty, nor worked without danger, unless the mouth of the womb be fully opened; and it is necessary to touch one or both ears, because they become the guide to the proper adaptation of the blades. To employ the forceps with advantage, then, the exact position of the child's head must be accurately made out; and this we learn by paying attention to the situation of the ears as regards the pelvis, and to the irregularities in their form. We keep in mind that the back part of the organ,—the helix, or flap,—is free and unattached, and looks towards the occiput; while the tragus is bound more closely down, and is directed towards the face. Thus the position of the ear, in respect to the pelvic cavity, informs us whether the head has made its turn; and the direction of the different points of the organ itself, determines whether the face is placed backwards or forwards, or sideways.

As soon as a necessity for instrumental interference appears, two questions of some importance will naturally offer themselves to our mind: the first, whether we shall call in the assistance of another practitioner, to advise us by his counsel, to aid us in the operation, and to divide with us the responsibility of the case; and the second, whether we shall apprise the patient of the necessity of such help, and obtain her sanction and approval. So far as the first question is concerned, narrow policy might perhaps whisper to us, that we should not unnecessarily throw our characters into the hands of a neighbouring, probably a rival, and perhaps not very friendly, practitioner. We may be led to argue, that we are giving him an undue superiority; that he may be tempted to take advantage of the confidence we repose in him, to worm himself into the good graces of our patient; that he may blazen it abroad he was consulted in a case so difficult, that we were incompetent to its management; and that to his judgment and dexterity the safety of the patient was to be attributed. A selfish and narrow-minded feeling might prompt us to reason thus; but I should hope there are few men in the profession who would be guilty of such a breach of professional etiquette—not to say of honour—as is implied in this suspicion.

But let us even look at the darkest point of the picture: we will suppose it probable that the person we consult may take advantage of our confidence, and endeavour to supplant us by specious misrepresentation: still I would recommend that the same principle should be acted on; and, strong in our own acquirements, in the integrity of our intentions, and the

propriety of our conduct, that we should disregard the ill-natured aspersions which envy or malice may circulate to our discredit: for there is such a comfort in the division of responsibility, such a consolation in knowing, if the case turns out ill, that we have not acted entirely on our own judgment, but that another party has sanctioned the means employed, and that all has been done which foresight could suggest; that we should be unnecessarily adding to the anxiety we must undoubtedly feel, if we allowed any petty jealousy to prevent our availing ourselves of the opportunity offered;—provided, indeed, the loss of time which must elapse in seeking assistance would not endanger the woman's safety.

The second question can be more easily disposed of. I presume that no operation in what is called *pure surgery*, is undertaken without the concurrence of the patient; and I do not know why we should place the obstetric branch of the science on a different footing, in this respect, from surgery in general. Many reasons would induce us to inform our patient of the necessity of relief being afforded her, and the propriety of the means we are about to adopt. If instruments are had recourse to surreptitiously, they must be employed at a great disadvantage; since we cannot, under these circumstances, direct the position and general management of the woman with sufficient accuracy: again, should it be subsequently discovered that artificial delivery has been practised, it will with great reason be presumed that the instruments were used for our own convenience, and not for her benefit; and should an unfavourable termination occur, we shall be most justly censured. Independently of these reasons, we have no object in concealing our intentions; for we generally find the woman quite ready to submit to our opinion, resigned to the necessity of the operation, and most willing to avail herself of those means of relief which we have it in our power to apply. Nay more; we shall often find greater difficulty in resisting the importunate entreaties urged both by herself and her friends to terminate the case, than to persuade them of the necessity, when that necessity exists.

Having, then, called in the advice and assistance of a medical friend, having concluded with him that the patient's safety demands that instrumental delivery should be had recourse to, and that the case is fitted for the use of the forceps; and having obtained the required sanction, we must sit down calmly and quietly by the bed-side, and determine most correctly the position of the head, if we have not learned it before.

There are eight situations of the head under which the forceps are available. The *first* is, where it has fully made its turn, with the face into the hollow of the sacrum, the occiput lying behind the symphysis pubis, or impinging on the upper margin of the arch, with the right ear towards the right ilium, and the left ear to the left side,—offering itself, indeed, at

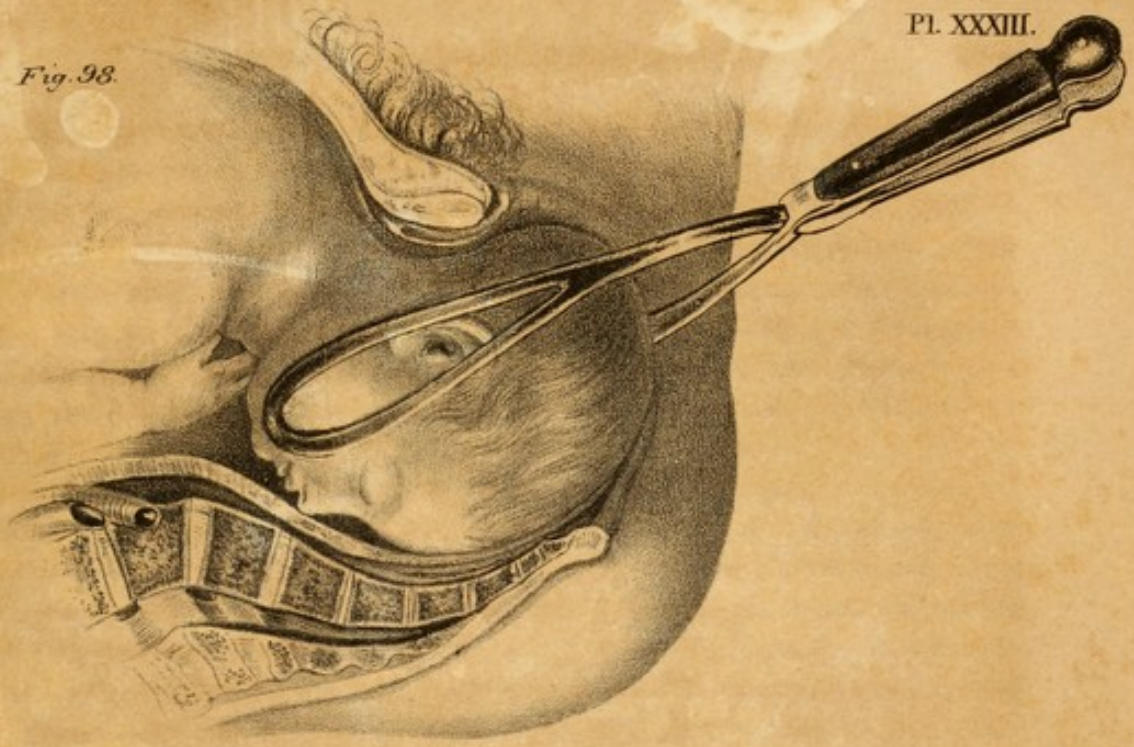
the outlet of the pelvis, in the position most favourable for its exit. Plate XXV. fig. 82, and Pl. XXXIII. fig. 98. The *second* is, where the head has passed the brim, and come down into the pelvis diagonally, with the face towards the right sacro-iliac synchondrosis, the occiput to the left groin, the right ear under the right groin, and the left ear before the left sacro-iliac synchondrosis. Plate XXIII. fig. 75, Pl. XXV. fig. 81, and Pl. XXXIII. fig. 99. The *third* is, where the head offers itself just in an opposite direction to the last, with the face looking backwards to the left sacro-iliac synchondrosis, the occiput forwards behind the right groin, the right ear against the right sacro-iliac synchondrosis, and the left ear behind the left groin. Plate XXIII. fig. 76. The *fourth* is with the face looking directly towards the right ilium, the occiput to the left, the right ear behind the pubes, the left ear against the hollow of the sacrum. Plate XXII. fig. 73. The *fifth* with the face to the left ilium, the occiput to the right, the left ear behind the pubes, and the right looking towards the sacral cavity. Plate XXII. fig. 74. The *sixth* is, where the face has offered itself anteriorly, has passed down diagonally, looking to one or other groin, and has eventually been thrown behind the symphysis pubis, the occiput having turned into the hollow of the sacrum, the right ear looking towards the left ilium, and the left ear towards the right ilium; as would be the case in Plate XXVIII. fig. 87, while the head was passing through the pelvic cavity, before the shoulders came to occupy the sacrum. The *seventh* case is where the head has also cleared the brim, with the face directed forward, but where the turn just described has not taken place, the face looking to the right groin, the occiput to the left sacro-iliac synchondrosis, the right ear to the left groin, and the left ear to the right sacro-iliac synchondrosis. Plate XXXIV. fig. 100, and Pl. XXIII. fig. 78. The *eighth* and last case is just the reverse of this again—namely, where the face comes down to the left groin, the occiput to the right sacro-iliac synchondrosis, the right ear towards the left sacro-iliac synchondrosis, and the left ear behind the right groin. Plate XXIII. fig. 77. In the last two situations the natural inclination of the head is to turn, with the face under the arch of the pubes.

When the head is placed in any one of these situations, and the symptoms require it, we feel ourselves warranted in attempting to deliver by the short forceps—provided the os uteri be fully dilated,—if we can feel an ear distinctly,—if there is sufficient space in the bony passages for the head to emerge,—and if the soft parts are sufficiently dilated to admit of its exit without suffering serious injury.

Before the forceps are introduced, the state of the bladder and rectum must be particularly attended to. Whether urine is detected by the hand or not, a catheter should be introduced, that we may assure ourselves of the organ being perfectly empty; and if any difficulty occurs in the inser-

Pl. XXXIII.

Fig. 98.



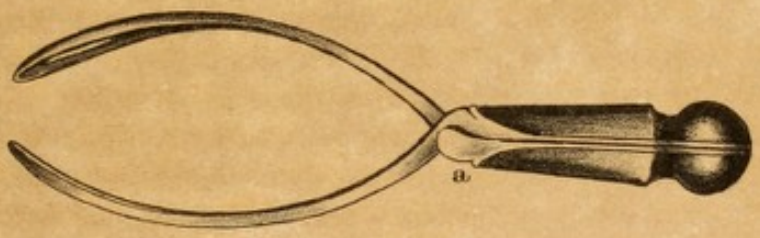
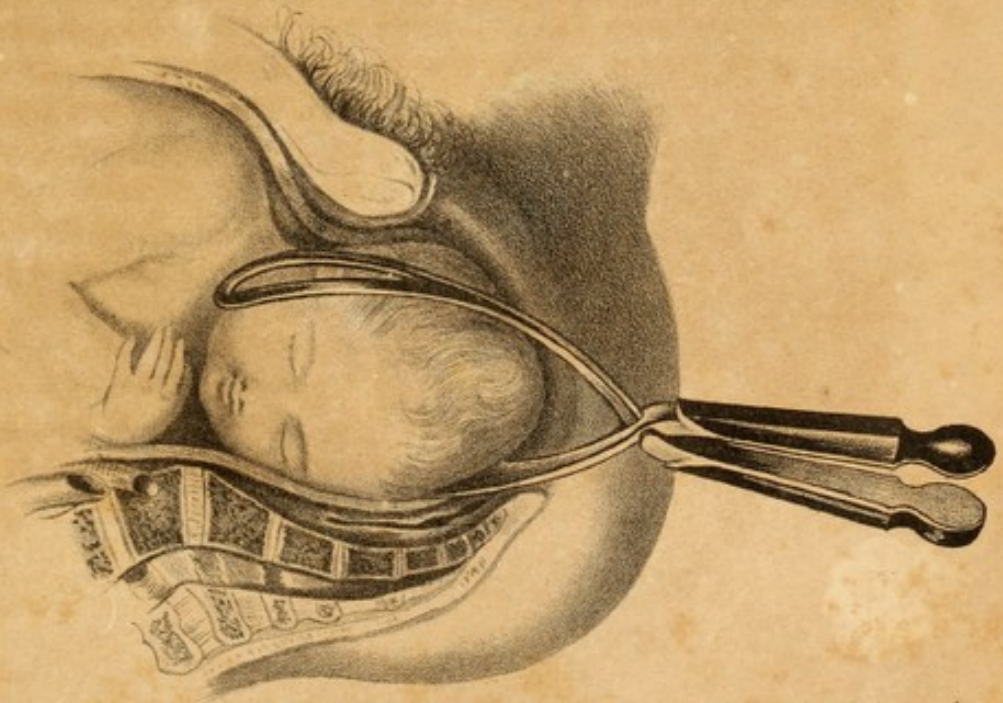


Fig. 97.



Fig. 99.



Sinclair's Lith.

tion of the common instrument, a flexible tube should be employed. We must also ascertain that the rectum be not loaded with fæces; and if so, it may be relieved by a simple enema. It is not so necessary to insist on clearing out the bowel, as on the complete evacuation of the bladder; and, indeed, when the child's head is fully occupying the pelvic cavity, the stricture produced by it is so great, that it is with extreme difficulty a clyster can be thrown up; and even when injected, the fluid only partially returns; so that we shall generally be foiled in our intention of emptying the lower intestines. It is my practice *always* to introduce the catheter, but not to administer an enema, unless an accumulation of fæces in the rectum be evident to the finger, when introduced into the vagina.

Mode of applying the forceps.—I will describe the most easy case first, as illustrative of the mode in which the forceps are to be applied, assuming that the face is in the hollow of the sacrum, the vertex presenting, and the perineum somewhat distended. Plate XXXIII. fig. 98.

It is not necessary that we should accoutre ourselves in any particular dress, or even take off our coat, for this operation; but it is desirable that we should turn up our coat sleeve, unbutton the wristband of our shirt, and free the fore-arm as much as possible from any ligature which dress might produce.

The patient lying in the common obstetric position—on her left side—must be brought so close to the edge of the bed, that the nates may project somewhat over, the knees must be drawn up towards the abdomen, and the feet planted against the bedpost, or supported by an assistant. The object in bringing her so near the edge is, that the handle of that instrument applied over the uppermost ear, may be lowered, and its point easily introduced.* If we attempt to operate while she remains in the middle of the bed, it will be impossible to depress the handle sufficiently; and the point cannot be introduced unless the blade be carried up within the sacrum, and then turned forwards over the ear; by which a circular sweep of a portion of the pelvis is made, and the maternal structures might be endangered. It is to prevent the necessity of removing the patient at all, that some practitioners, as Hamilton, have adapted a hinge in the shank, and others, as Conquest, prefer a handle attached to the blade by a screw. The instrument having been warmed (by placing it in hot water, so as to bring it as nearly as possible to the temperature of the body) and greased with some unctuous substance, two fingers of the left hand, previously anointed, must be carried over the uppermost ear, which

* It is of the greatest importance for the success of our operation, that the patient's position should be carefully superintended. I have myself known some instances of failure for want of this very necessary precaution.

is generally the one most easily distinguishable. One blade of the instrument is then to be taken in the right hand; being gently poised between three fingers and the thumb, its handle must be lowered, so that the point may slip up towards the pelvic brim, between the fingers and the head; it must be directed over the ear by the fingers, which are to act as the guide, and insinuated upwards by a gently waving or wriggling kind of motion. In the introduction the point must be kept closely in contact with the fœtal head: the attempt must be made in the interval of pain, and desisted from should uterine contraction occur; and if any material resistance oppose its passage, we must not endeavour to overcome the impediment by force, but give a new direction to the blade, a little more forward or backward, in whichever way it passes most easily; and thus gradually slide its extremity upwards, until its complete insertion. On its being so fully introduced, that the groove for the lock projects slightly beyond the external parts, it must be preserved in that situation by the little finger and thumb of the left hand, or by an assistant, and we must proceed to pass up the second. This must be introduced, directed by the fingers, in a similar manner to the first; and if they are both properly applied, the groove of one blade will fall into the groove of the other, so that they will lock together without difficulty or exertion; and nothing is left for us to do but make extraction. If it should happen, however, as will often be the case, that when the blades are both introduced, they are not perfectly opposite to each other, and consequently do not lock easily, they must not be wrenched round, in order to make them fit,—for by so doing we shall bruise the woman's parts,—but we must withdraw the one last introduced, and pass it up in a different direction. We had better withdraw it two or three times than lock the blades by force.

Another point to be attended to in the application of the instrument is, that we should so introduce the blades, that the grooves to form the lock should be internal in respect to each other,—for if this be overlooked, it is impossible to fix them, unless each handle be forced completely round the other, or one be withdrawn. On closing the lock, we must be particular that none of the soft parts be pinched, and especially that none of the hairs are entangled within the grooves.

Our next indication is to extract; and we must do this with a regular, slow, waving, pendulum-like sweep from handle to handle, keeping the instrument back to the perineum as closely as we can, so that traction may be made in the direction of the axis of the pelvic brim. We extract with the right hand, while we support the perineum with the left. If there be pains, we take advantage of them, and act while they continue, resting in the absence of uterine contraction; and the child's head must be relieved from pressure, during the interval of action, by opening the lock. If there

be no pains, we imitate nature, by working for two or three minutes together, and then relax in our exertions for the same period, taking care during the interval to guard the lock by the fingers, so that the blades shall not slip. In the course of a short time, we shall find that the head makes some advance,—that the perineum becomes more distended, and at last the vertex will appear externally. The direction of our power is then to be in some degree changed, and we must follow the axis of the pelvic outlet. We no longer keep the handles close to the perineum, but turn them rather forwards, and upwards towards the abdomen; and, by a continuance of the same pendulum kind of action, the forehead will emerge, and eventually the face and chin; during the passage of which, the perineum will demand our especial protection.

In most of Smellie's plates the handles of the forceps are tied together by a tape; and this practice is still adopted by many. I disapprove of such a ligature, because the hand possesses quite sufficient power to make the requisite compression; and because, if the pressure be continued uninterruptedly, the child's life must be placed in great jeopardy; and for these reasons I have never myself employed it.

Cautiously and tenderly must this iron instrument be used! We must recollect that no sensation can be imparted to the operator's hand of any injury that may be done to the woman; and we must remember that one injudicious thrust, one forcible attempt at introduction, one violent effort in extraction, may bruise, may lacerate, may destroy! Bearing in mind, however, the kind of case in which it is useful and admissible;—bearing in mind the principle on which it ought to be employed;—recollecting that it is a lever of the first kind;—that the metallic blades have no feeling, and cannot communicate to our perceptions a knowledge of any mischief we may inflict, we are not likely to fall into any grave error in its application or its use.

Mode of applying the forceps, when the head has entered the pelvis, before making its turn.—But we may be driven to the use of the forceps before the head has made its turn with the face into the hollow of the sacrum, while it is lying diagonally with the face to the right, Plate XXXIII., fig. 99, Plate XXIII. fig. 75, or left, fig. 76, sacro-iliac synchondrosis, or laterally to the right, Plate XXII. fig. 73, or left ilium, fig. 74. It is very evident that in this case, although the head may be sufficiently low to enable the finger easily to command the ear, still it cannot be expelled or extracted, until it is placed in a more favourable situation for its exit. It has been already more than once demonstrated that the short diameter of the outlet of the pelvis is from side to side, and the long diameter from the fore to the back part, which is just the reverse of the brim; and,—inasmuch as the long diameter of the head, while lying in this position, is

in the direction of the short diameter of the outlet, and nature will not effect the necessary turn,—we must perform it for her, before extraction can be accomplished. This is then a more complicated case than the one just described—the symptoms are the same—the reason why we should employ instruments are the same—but the mode of using them somewhat varies. It is probable that in this case we shall not be able to feel the ear which is placed posteriorly; but that towards the pubes may be detected readily; and this is all that is necessary for the purpose: because, if we distinguish one ear, that will become an index to the other; and if we pass a blade over it, and make the second blade a perfect antagonist to the one first introduced, both must be properly adjusted. Having introduced the forceps with the cautions and gentleness before inculcated, the same pendulum-like sweep must be used for extraction; but independently of our extractive effort downwards, we must make a slow rotatory motion, the wrist being directed outwards or inwards,—in regard as the face lies to the right or left side,—so as to throw it into the hollow of the sacrum; by which means we convert the case into one of the first kind. We can generally make this turn without any great difficulty; but before we attempt it, it is indispensable that we should have accurately learned to which side the face was originally looking.

When the face is towards the right side, our object being to turn it into the hollow of the sacrum, the motion of the wrist must be inwards, or that of semi-pronation; but when it is towards the left side, it must then be directed outwards, in the mode of semi-supination. But it will naturally be asked how we are to know when the face is in the hollow of the sacrum. This knowledge may be very easily acquired. If the blades have been applied over the ears, as they should be, the rivets in the handles will be brought into a line with the tuberosities of the mother's ischia, as soon as the head has completed this turn, but not till then. This being accomplished, extraction may be commenced. It is in the application of the instrument under this diagonal position of the head that the straight forceps are preferable to those with a lateral curve, in the hands of a young operator. The curved instrument of Levret and Osborn possesses a right and a left hand blade, and requires to be adapted to the head so that the convex edge should look towards the face, and be directed along the concavity of the sacrum, after that the head has made its turn and is passing outwards; and it requires no little consideration, so to adjust the blades that the convexity may fit into the curve of that bone. Should the *concave* edge, by mistake, be directed backwards, the points projecting beyond the child's head will rub against the posterior part of the pelvis, and most probably produce injury. It is by no means impossible that this accident

may occur to one unpractised in operative midwifery; and while such a *possibility* exists, it is much better to have recourse to those means which are least likely to do harm. The advocates for the use of the curved instrument allege that it embraces the head by more points of contact than the straight. This may be true; but even granting their position, that superiority would not counterbalance the chance of disasters likely to arise from a mal-application of the blades.

Occiput in the hollow of the sacrum.—In the sixth case,—where the face has come forward, and the head has made a turn, with the occiput into the hollow of the sacrum, and the face behind the pubes, it has not taken a fortunate position for its eventual exit; and although the woman may have had children before, still it is very probable that this will not pass by the unaided efforts of nature. Our indication here is evidently to extract the child as it lies, although the situation is not the most favourable that could be chosen. I should presume no one would think of turning the face in the hollow of the sacrum before extracting, because nature has already accomplished the greater part of the difficulty—that of bringing the long diameter of the head into a line with the long diameter of the pelvic outlet. The same care is requisite in the introduction of the forceps in this case as in others; but, in extracting, the handles must be kept farther back towards the perineum, because the face will require a greater sweep to clear the pubes, than the occiput would if it were forward: the head does not adapt itself so commodiously to the passages; the bones do not overlap each other so completely; its general figure does not become so conoid, and consequently considerably more room is required for its transit.

Face towards either groin.—This situation of the head,—as the others,—may be learned by the position of the ear and attention to its figure. If the face is looking to the right groin, Plate XXIV. fig. 78, the right ear will be felt behind the left groin, with the helix directed downwards, as the woman lies on her left side: if to the left, Plate XXIII. fig. 77, the left ear will be discovered behind the right groin, with the helix directed upwards. But in making our examinations for this purpose, we must be careful not to double the flap upon itself, otherwise we may be lamentably deceived in regard to the direction of the face. The instrument must be introduced over the ears, in the same manner as before. In this case we have the choice of two methods by which to extract the head—we may either bring the face under the pubes, making a quarter turn along the half pelvis, or we may make a three-quarter turn, and throw it into the hollow of the sacrum. Of these modes I should certainly prefer that in which there is the least turn to be made—namely, with the face under the pubes,—provided it could be effected; because, we are less likely to

do injury to the mother, and also to the child. If we make a three-quarter turn, we may injure the mother's parts by bruising, and perhaps by laceration; and we might even destroy the child: for if its body be strongly embraced by the contracted uterus, and do not follow the extensive turn which we cause the head to make, we must infallibly twist its neck considerably; and we might dislocate the vertebræ, to the destruction of its life. But although I recommend that an endeavour should be made to bring the child with its face forward, still if it will not pass in that direction, without great exertion being used, rather than have recourse to the horrible expedient of craniotomy, I would advise that the method of acting should be changed, and the face turned into the hollow of the sacrum. I have frequently effected this alteration in position, though it is usually attended with some difficulty. Plate XXXIV. fig. 100, shows the forceps applied, the face being directed to the right groin. The bladder is here represented considerably distended; under such a state the action of the instrument must endanger its structures.

Here, again, we remark the superiority of the straight over the laterally curved forceps; for it is evident, if we apply a curved instrument while the head is in this diagonal situation, with the intention of causing the occiput to sweep the perineum, the convex edge must be towards the occiput, and the concave towards the face. If, then, we should fail in bringing the face under the pubes, and endeavour to direct it backwards, the blades must be withdrawn and re-adjusted, each over the opposite side of the head to that on which it was first adapted, to prevent the points of the instrument rubbing against the structures at the posterior part of the pelvis; since they would project considerably beyond the chin. Thus, by the withdrawal and re-adaptation of the instrument, the operation would be greatly complicated. As the straight blades, on the contrary, are perfectly similar in form, the rotation may be accomplished without in the least disturbing their position.

Symptoms indicating the propriety of employing the forceps.—Some practitioners of repute deduce their rule for the propriety of having recourse to the forceps, principally from time; they say, that when the patient has been twelve or twenty-four hours in strong labour from the period at which the membranes broke, we are warranted in having recourse to the short forceps, provided we can employ them without injury.* Though by no means of universal application, this rule is not to be despised: nevertheless, it must be received with much limitation; because some women will bear up against the fatigue of labour for twenty-four hours with

* Blundell's Obstetricy, by Castle, p. 530

less exhaustion of the constitutional powers than others will sustain in six.* And the converse of this position holds equally good; for in some cases we should not be justified in having recourse to instruments, although the twenty-four hours had passed; because the system will have suffered comparatively in a trifling degree.

Others tell us that we are to pay little attention to time, but look chiefly to the symptoms present. This, to a certain extent, is also true; but the parts will not sustain pressure for a continued length of time without suffering injury. I have already mentioned, that if the head have been impacted for four hours without advance and recession, I think we are warranted in delivering, merely for the purpose of preserving the soft structures uninjured.

Drs. Hunter, Denman, and Osborn, trusted cases of labour almost entirely to nature. Osborn,† in stating the symptoms requiring the use of forceps, says, "All the powers of life are exhausted, all capacity for farther exertion is at an end; and the mind as much depressed as the body, they would at length both sink together under the influence of such continued but unavailing struggles, unless rescued from it by means of art." Here we recognise a complete wreck of the powers of life; and as Burns‡ justly remarks on this passage, if such a state be allowed to take place, the exertions of art will in general prove as unavailing as the struggles of nature; if *all capacity* for farther exertion is at an end, we can scarcely expect the system to rally. Denman§ also says, "As long as the efforts of the mother continue with any degree of vigour, there is always reason to hope that they will ultimately accomplish the effect of expelling the child without any artificial assistance; in which case the use of the forceps is not required." Again, he says, "A practical rule has been formed that the head of the child shall have rested for *six hours* as low as the perineum, that is, in a situation which would allow of their application, before the forceps are applied, although the pains should have altogether ceased during that time;" so that if the head have been on the perineum two hours, and the woman be sinking from exhaustion, according to this rule, he would

* Early in the year 1834, I was called to a patient in a state of depression, from which she never recovered, although not more than six hours had elapsed since the rupture of the membranes. I delivered her under the worst symptoms of exhaustion, such as cold extremities and dark vomiting. She had been in health previously to the accession of labour: there had been no hæmorrhage nor laceration, nor any cause for her depression, except the fatigue consequent on great exertion. In this case death would probably have taken place long before the twenty-four hours had expired.

† Essays on the Practice of Midwifery, p. 60.

‡ Principles of Midwifery, fifth edition, p. 422.

§ Chapter xi. sect. 4

allow four more hours to elapse before he would think of having recourse to the forceps.

We must take these recommendations of Hunter, Osborn, and Denman, however, with some limitation, and recollect that they lived at an age when instrumental interference was frequently had recourse to unnecessarily; that nature was seldom or never allowed to accomplish her object; but the hand was constantly thrust into the vagina and uterus, to dilate the parts;—instruments were employed to extract the child;—and the rudest means were used to bring away the placenta. A most beneficial object, then, was gained by the recommendations of these great men, and the strong language in which they clothed their instructions: a great revolution was gradually effected in the practice of the age, and obstetricians were taught to rely more implicitly on the powers and beneficence of nature. But however useful it might have been during the lapse of the last century to paint in glowing colours the dangers of instrumental interference, and the all-sufficient agency of nature, the cautions then inculcated are fortunately, in a great measure, uncalled for at the present time.

If we were to follow implicitly the doctrines of those who regard nature as capable of surmounting all difficulties, we should be led to the conclusion, that, provided the child were born without artificial aid, the mother's structures could not possibly be endangered; while, on the contrary, they must necessarily receive injury under the use of the forceps, however skilfully employed. But these positions are both far from true; for on the one hand, in many instances where the labour has been wholly unassisted, and the termination been perfectly natural the pressure caused by the child's head on the parts within the pelvis has produced sloughing and subsequent death; while, on the other, the instrument, if properly and tenderly applied, and used in a legitimate case does not occasion more pressure or pain than would have been suffered if the case had been concluded by nature. During extraction, indeed, there may be some aggravation of suffering; but that pain is comparatively speedily terminated; and in the generality of instances the aggregate quantity is less than the patient would have undergone, had she been trusted to her own powers, even if they had expelled the fœtus unaided. It may be supposed that the steel must produce more pressure than the child's head; and this may be in some measure correct; but it must be recollected also that, independently of the instrumental pressure being continued for a short time only, the closing of the blades occasions a diminution in the lateral diameter of the head, which must in the same degree relieve the maternal structures; the space thus gained being more than the thickness of the double blades.

To determine the precise period at which the forceps are required, or

may be used with safety and advantage, is one of the nicest points that can be forced upon the attention of the practitioner. The principal evils that we have to fear, are the sinking of the patient's strength through exhaustion, laceration of the uterus or vagina; such a contusion of the vagina and perineum as to produce subsequent inflammation, suppuration, or sloughing, and inflammation of the uterus, from excessive action.

With these evils before us, we should steer a middle course between the two orders of practitioners just mentioned, and deduce our indications partly from time, but principally from symptoms; taking care at the same time that the patient's strength is not so far exhausted, before aid is given, as to render recovery hopeless; for surely that man who allows death to steal on by slow degrees, through his own ignorance, timidity, or supineness, is at least equally culpable with him who employs harmless means rather earlier than absolutely necessary, with the honest intention of relieving his patient from present suffering, removing her out of the chance of extensive injuries, or snatching her from threatened dissolution. It must not be supposed, however, that I am an advocate for the frequent employment of instrumental means, although of a character to do no injury. I merely wish to state my conviction that such assistance had better be rendered, *rather before* it is actually called for, than be delayed till it be *rather too late.*

The rule which I offer for the guidance of the younger members of the profession, is taken from a number of circumstances in combination. *First,* we must attend to the previous history of the woman. If she have hitherto been in good health, and is well formed, she is so much more likely to bring her child into the world without assistance; if, however, she have been confined for any length of time by illness, we should expect the powers of the system might not be sufficient for the end proposed. But this observation by no means applies universally, for in the last stages of the most debilitating diseases—such as dropsy and phthisis—the labour is usually terminated naturally. Again, if the patient has had children before, we should expect that this may be born also; unless, indeed, the head be very large, or strongly ossified, or wrongly placed, or hydrocephalic.

Secondly, we must look to the duration of the labour. This is generally attended to by the patient and her friends, (who are, of course, unable to form a judgment by symptoms,) more than any other circumstance. It is certainly a good general rule to consider, that if the labour has lasted more than twenty-four hours from the rupture of the membranes, there is a great probability that instruments will be required; and that if the head has been impacted four hours, the soft parts must be much endangered.

Thirdly, we must regard the progress of the labour. If the head advances at all, and be not impacted, provided the strength and spirits

are good, there is seldom need to interfere; but if no progress have been made for a number of hours, and especially if impaction* should have existed for four hours, then,—provided an ear can be felt,—and the parts are not so rigid as to endanger laceration, we are justified in employing the forceps.

Fourthly, we must consider the remaining strength. Women often suppose they are sinking, and will be earnest in their declarations that they have not strength left to go through their labour, when their power is unimpaired; although there may be a feeling of weariness. There is no word so much abused in the lying-in room as *exhaustion*. The patient will often assure us she is perfectly exhausted, when the uterus is acting with undiminished energy; the solicitous friends will echo the same sentiment, while she is walking about the room, leaning on her nurse's arm.

Exhaustion is accompanied and known by a very quick pulse; if it be under one hundred beats in a minute, there is seldom occasion for apprehension; but if it have gradually mounted to one hundred and twenty, one hundred and thirty, or one hundred and forty, our suspicions should be awakened to the probability of approaching exhaustion. It is also known by the pains gradually subsiding in frequency, strength, and duration. We must not confound with this state the sudden suspension of uterine action, which we sometimes observe in the progress of the most natural labour, and which we can seldom account for; the pulse, tongue, countenance, and spirits, remaining good and unaltered;—when the pains decline from a countinuance of exertion, there are other accompanying symptoms which powerfully indicate distress.

Another proof of commencing exhaustion is a peculiar olive-coloured discharge from the vagina; and this symptom usually is not sufficiently attended to. I seldom or never saw a case in which exhaustion was approaching, that was not accompanied by this characteristic uterine discharge. Sometimes there is merely a stain on the linen, at others it flows away in large quantity. It possesses a faint and unpleasant odour, though not in the least putrid. This discharge has been looked upon as meconium mixed with the liquor amnii; and its appearance has been considered as a sure test of the death of the child, because it is generally

* By the terms *impacted*, *jammed*, or *locked* head, is understood that state, in which it neither advances during the presence, nor retreats in the absence of uterine contraction; when it remains fixed, occasioning strong, constant, and universal pressure on the soft parts within the pelvic cavity. It differs from the more simple *arrested* condition, which merely means such an absence of actual progression with each return of pain, as to render the labour *for the time* stationary; but in which the parts are relieved from continued pressure by the head receding in the interval of the parturient throes.

supposed, that when the head is presenting, the meconium would not appear externally, unless it had been voided from the bowels in the last death-struggle. I am persuaded, however, that it is not meconium; and I have known many children born alive, who had been declared dead from this erroneous impression. I believe it consists in an altered secretion from the lining membrane of the uterus, consequent upon great exertion and long-continued action;* and look upon it as one of the first indications of exhaustion.

Again: exhaustion is known by the breathing being hurried, by the countenance becoming anxious, the eyes dull and sunk in their sockets, the appearance around them dark, and the cheeks exceedingly pale, sallow or flushed in patches. The face generally assumes much of the character given to it in low fever.

The tongue will also guide us in our opinion. If the mouth is moist and clean, there cannot be much fever; but if the tongue become loaded with a white fur, fever is present; or if it be coated with a dry brown sordes, that is one indication of commencing exhaustion.

Vomiting also generally occurs in consequence of exhaustion from great exertion, as it often accompanies depression of the powers in the last stage of fever. The matter ejected from the stomach is of the same character in both cases; it is blackish, or has a coffee-ground appearance, and it may be fetid. We must discriminate this vomiting—as I have before remarked†—from that which occurs at the commencement of labour, dependent on the opening of the os uteri; nor is it probable that we shall fall into a mistake in this particular.

Shivering is another symptom of exhaustion, when it appears after many hours of suffering have been sustained; and it also indicates great local injury either to the pelvic structures from pressure, or to the uterus itself.

Coldness of the extremities, accompanied with clammy perspiration, is a very unfavourable sign indeed: if there be cold sweats over the legs, arms, and neck, we may consider that the patient is in imminent danger.

If delirium be present, we may be perfectly satisfied that there is some mischief going on either in the uterus, the pelvis, or the head; and such a case would require extreme care. We may, perhaps, be inclined to bleed. Delivery will often at once relieve this distressing symptom. Another state of mental aberration is that of low muttering. The woman lies quiet, appears to be talking constantly and rapidly, but her articulation is imperfect; and delivery affords the only chance of saving life under this state. These last two symptoms may be regarded as most danger-

* See my father's Practical Observations, Part I. p. 270.

† Page 92.

ous; they are usually preceded by long-continued wakefulness; which, of itself, is one of the many proofs of exhausted powers.

The *fifth* indication is the state of the passages. If these are moist, soft, cool, and not tender—if we can pass our finger all round the head easily, we may be sure that there is no impaction, and we need not deliver for their sake; but if the parts become dry, hot, swollen, and painful, so that the patient can scarcely bear the least touch upon them, then there must be injurious pressure, and,—to prevent sloughing, we must terminate the labour, though there should be but few of the general symptoms that I have mentioned; it is seldom, however, that local injury exists in any part of the body without the whole system sympathizing. If the patient be robust, we may bleed from the arm; if we cannot venture to take blood, we may use fomentations, and endeavour, by local means of such kind, to remove the inflammation: and if the case be adapted for it, we may have recourse to the use of the short forceps. The longer the pressure is continued, the worse will generally the case become.

Finally, the state of the uterine tumour becomes an indication for delivery. If the abdomen be not tender on pressure, there is no inflammation; but if the application of the hand gives great pain, we have every reason to fear the approach of diseased action. There is no question that inflammation of the uterus itself may be produced by a long continuance of its excessive exertion; but as this is usually accompanied by diminished power in the general system, it is seldom to be removed by bleeding; under such a state, indeed, it would not be always safe to abstract blood freely: delivery offers the only rational method of relief.

Summary of Symptoms.—If, then, the pains are subsiding gradually, or have entirely disappeared,—if the strength is failing, the spirits sinking, the countenance becoming anxious,—if the pulse be one hundred and twenty, one hundred and thirty, or one hundred and forty, in the minute, —the tongue coated with a white slime, or dry, brown, and raspy,—if there have been two or three rigours,—if, on pressing the abdomen, there is great tenderness of the uterus,—if there be a green discharge—if there be preternatural soreness of the vulva, with heat and tumefaction of the vagina—if the head have been locked for four hours, and made no progress for six or eight hours,—if the patient be vomiting a dark coffee-ground like matter,—if there be hurried breathing, delirium, or coldness of the extremities,—then we are at any rate warranted in having recourse to the forceps, although the labour have not lasted the limited period of twenty-four hours or even twelve: and we should be acting injudiciously to allow the case to proceed until the four last-named symptoms appear, without relief being offered.

But so long as the uterus is acting with energy, the strength and spirits good, the countenance natural and cheerful, the pulse under one hundred, the tongue and mouth moist and clean—so long as there is no vomiting nor rigours, nor heat, swelling, nor tenderness of parts; no green discharge, no pain on pressing the abdomen—so long as the head retreats in the absence and advances in the presence of pain, provided there be any progress in the labour from hour to hour—so long there can be no necessity for instrumental aid; although the case may have lasted considerably beyond the specified limit.

VECTIS.

Another instrument that has been much employed with the view of extracting the child living, is the VECTIS OR LEVER;* it consists of a single blade; and of all the varieties that have been fashioned, Lowder's appears to me to possess the most useful form.

Much uncertainty still hangs over the origin of the vectis; and we are without any positive records, either regarding the real inventor, or the precise time when it was first used. It is generally attributed to Roonhuysen, of Amsterdam, and even now bears his name; but I am inclined to think that the elder Chamberlen, who certainly introduced the modern forceps into practice, was also the inventor of the vectis.† This, however, is a matter of little importance in a practical point of view; it is of far greater consequence that we should select the best form of instrument, provided we are induced to trust it. It should be twelve inches long, in a straight line from one extremity to the other, seven of which should be engrossed by the blade. The blade should not spring from the handle in a regular sweep, as is the case with the forceps; but should possess a shank, nearly straight, for the space of three inches, retiring backwards, at a very small angle. The curve should then commence gradually, and the point should be bent forwards rather abruptly. The widest part of the

* I think both these terms highly objectionable; because if the instrument is used as a lever of the first kind, which is that most commonly known in mechanics, we can scarcely avoid making injurious pressure on the soft parts of the mother; and also because the term *vectis*, as employed by the Latins, carries with it an idea of force and violence; since that was an engine applied to raise great weights, wrench open doors, and perform other acts requiring considerable strength. The names *extractor* given to it by Dease, and *tractor* by Blundell, are much preferable to that of vectis, because they will lead to a safer use of the instrument in practice.

† See Medical Gazette, May 31st, 1834, p. 305, et seq.

blade should be near the point, about one inch and seven-eighths across, and the fenestra should be inclined to an oval shape, two inches and a quarter long, and an inch and one-eighth broad in the centre; the weight of the instrument should be about seven ounces. The specimen delineated in Plate XXXIV. fig. 101, possesses Saxtorffe's hinge; but this is of no advantage in its use; it is merely for the convenience of carriage. Others are made with the handle to unscrew; and this might lead to the inference that it was intended the blade should be passed up first, and the handle screwed on afterwards; such a mode of proceeding, however, will be found inconvenient, and seldom practicable.

Cases in which the vectis is applicable, and mode of using.—All the cases in which the short forceps are applicable, are supposed to be fitted for the use of the vectis; and the symptoms calling for its employment are necessarily also the same. Three modes of using this single blade have been suggested;—either as a lever of the first kind, or as an antagonist to the left hand introduced into the pelvis, or as a simple tractor; which last, indeed, is the only safe method. Chamberlen and Roonhuysen used it as a lever of the first kind; and they made the pubes of the mother form the fulcrum.* I need not insist on the mischief likely to result from this mode of acting: it is merely necessary that attention should be called to the bladder, placed directly behind the junction of the pubic bones, to imagine the dangerous pressure to which it, as well as the surrounding structures, must be exposed, were we to adopt Roonhuysen's plan. The injuries inflicted, indeed, must have been frequent and great; and this led Pean, in 1772, to suggest the possibility of delivering by the vectis, without making a fulcrum of the mother's structures. He proposed a practice, which is now sometimes adopted, of grasping the shank of the instrument with the left hand,—the outer edge of the little finger being applied towards the vulva,—making that hand the fulcrum, and pressing the extremity of the blade on the child's head, by raising the handle firmly held in the right hand. Though not so easy a method of delivery, this is much safer than that first recommended, and, *if used as a lever of the first kind at all*, the instrument should be employed in this manner.†

Another mode practised was the introduction of the instrument over one side of the head, and the application of three or four fingers of the left hand over the opposite, which were intended to act as an antagonist to the iron blade, and with it to obtain a perfect grasp of the head, as the for-

* Camper; "Remarques sur les Accouchemens, et sur l'Usage du Levier de Roonhuysen." Mem. de l'Académie de Chirurgie, tom. v. p. 729.

† See a treatise by Perret, a Parisian cutler, in *Descriptions des Arts, et des Metiers.* Paris, 1772.

Fig. 100.

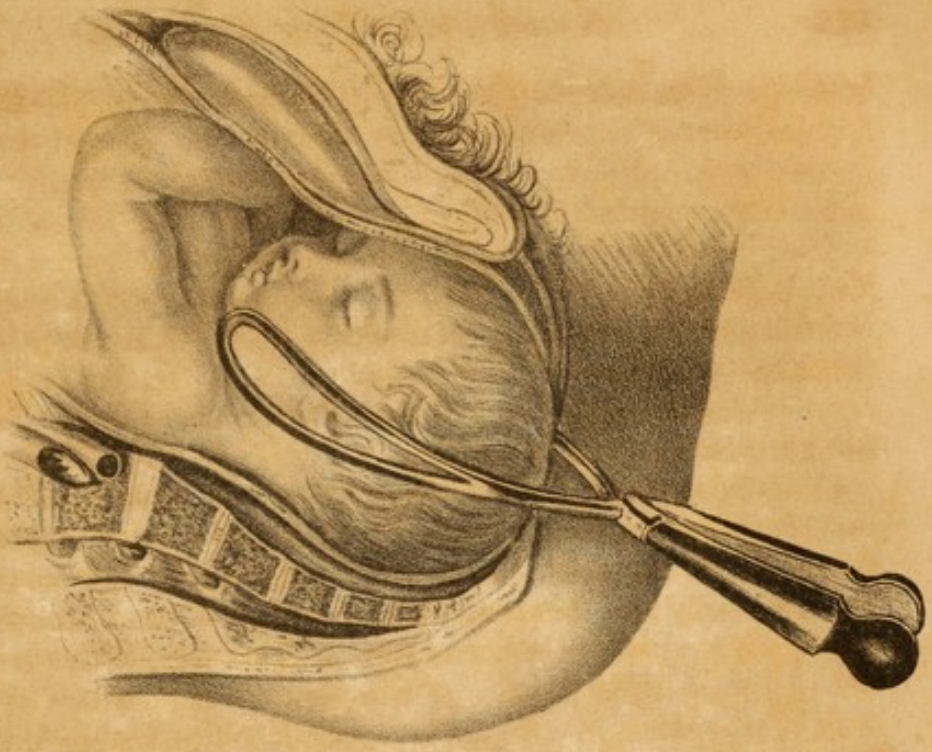


Fig. 101.



Fig. 102.



Sinclair's Lith.

ceps does; and as the latter instrument is to be regarded as a pair of artificial hands, so the vectis, if used in this way, must be looked upon as a substitute for the right hand. But it is evident that, if there be sufficient room in the pelvis to allow of the introduction of three or four fingers, over the head, there can occur very few cases in which instrumental assistance is necessary. This mode of using it was first adopted by De Bruas, about 1755.*

In 1783, Dease of Dublin gave a new name to the instrument, which much influenced the mode of using it. He called it an *extractor*, and proposed, that on the point being carried fully over the child's head, the handle should be grasped tightly, and held firmly, by one hand, while the shank was embraced by the other, and the movement, that of steady traction downwards, should be given by that hand which embraced the shank, thus converting the instrument into a lever of the *third* species. He states his opinion, that if used as a lever of the first kind, it must always prove highly dangerous, "retentions of urine being the immediate, and involuntary discharge of urine the lasting consequences of it."† The mode recommended by Dease is that now generally adopted—that which I would advise the young practitioner to follow, provided he be inclined to call in the aid of the vectis.

This instrument, consisting of only one blade, and being very easily introduced, has often been employed clandestinely, and without the knowledge either of the patient or her friends; and Lowder, as one of the arguments in its favour, brought forward the facility with which it could be used, as a means of terminating the delivery *secretly*. It is not possible, in my opinion, to offer any better reason for discarding this instrument from practice, than that insisted on by Lowder as one of its chief recommendations; for in this age, if any man accustoms himself to use the vectis, or any other obstetric power clandestinely, such interference must in the end lead to disgrace and bitter self-reproach. In regard to the vectis, then, we should act exactly as with the forceps—inform the patient and her friends of the necessity of assistance being rendered, and never interfere unless circumstances demand our aid. Before the introduction of the instrument, the bladder must be emptied by the catheter, and the rectum unloaded also, if requisite. The same posture must be adopted as previously recommended: the patient's person must be brought conve-

* The Practice of Using *the Spoon* Restored, with a Short Account of other instruments employed in Midwifery. By J. H. De Bruas, Middleburgh, 1755; in the Dutch language.

† Observations in Midwifery, particularly on the Method of Delivery in Difficult Labours. Introduction, p. 6.

niently near to the edge of the bed, and the instrument warmed and greased. Two fingers of the left hand are then to be passed as high as possible within the vagina, over the child's head; the handle of the instrument must be held tightly in the right, and depressed sufficiently low to allow the point to slide up between the fingers and the head. The same kind of semi-rotatory motion recommended in the application of the forceps, will also facilitate the introduction of the vectis; and, as with the forceps, if any impediment occur to its easy passage, that must not be overcome by main force, but a different direction must be given to the blade, and the obstacle must be surmounted by gentle insinuation. On the complete introduction of the instrument, the fingers of the left hand are to be withdrawn, and the shank so grasped with that hand, that the little finger shall lie near the os externum, and the first finger surround the junction of the handle with the blade. Plate XXXIV. fig. 102. Thus a firm purchase is obtained; and the whole instrument must be steadied with the right hand, while traction is made with the left. The extractive power must not be a constant, strong, uninterrupted *pull*, but must consist of a number of short, steady, firm, extractive efforts, following each other in tolerably quick succession; the left hand pressing strongly against the shank under each, so that the point may at the same time compress the head, while the handle remains stationary. Here also, as with the forceps, we must work during the continuance of contraction, and desist in its interval; and should the uterus be inert, we must imitate nature, making our traction only occasionally. This instrument is much more likely to lose its hold than the forceps; but as it is easily re-introduced, and as there is no second blade to adjust, that occurrence is of little consequence.

In employing the vectis, then, we shall find it necessary to apply it over different parts of the cranium, successively, in order to relieve the head from its fixed situation, and favour its descent; and we may sometimes feel it necessary to use it one minute as a tractor, and the next as a lever; being, however, most cautious to make the fulcrum of *our own left hand*, as first recommended by Pean. The occiput, and the projection behind the ear, answering to the site of the mastoid process, will offer the best position for the application of the instrument's point.

The relative value of the vectis and forceps as obstetrical assistants has been the subject of much controversy. Some practitioners invariably used the vectis—as Bland, Lowder, Dennison, and Sims; others gave the preference to the forceps, among which number were Smellie, Denman, Osborn, and Hamilton; of the present teachers, I believe most are in the

habit of employing the latter.* We must, however, receive the recommendations even of practical men on this subject *cum grano salis;* we must recollect that early instruction is likely to prejudice every one in favour of any particular instrument, and that a certain degree of acquired dexterity in its use would probably attach him to it, and cause him to recommend it. Thus, then, although one practitioner may wield the forceps, and another the vectis, with the greatest advantage, it by no means follows, either that his pupils should be able to administer artificial aid with the same success, or that they should find the superiority of one instrument so decidedly outweigh that of the other, as they might be led to imagine if they listened to the doctrines of those practised exclusively in the employment of either. If, however, it can be shown, by legitimate arguments, that the one instrument possesses a decided advantage over the other, we are bound to use that means which offers the fairest prospect of success; until, indeed, by actual experience, we become convinced of the fallacy of our previous impressions.

Arguments in favour of the vectis.—The arguments in favour of the vectis are,—*first*, that there being but one blade, it is more easily applied; and that as the greatest difficulty in introducing the forceps consists in adjusting the second blade, that inconvenience is of course obviated. *Secondly*, that extraction can be more easily effected with it. *Thirdly*, that being so easily applied, it is not necessary for the operator to ascertain so intimately the nice obstetrical points connected with the case, or to make himself so minutely acquainted with the position of the head, as when the forceps are used. *Fourthly*, that it can be used in cases where the short forceps are perfectly inadmissible—before the head has descended sufficiently low for us to feel an ear; because we do not guide this instrument over the ear, but introduce it where we can most easily apply it, and where we can obtain the most useful purchase.

Each of these arguments deserves a distinct consideration. In the *first* place, I would readily grant that the single instrument can be more easily applied than the two-bladed forceps; but I cannot accede to the proposition that delivery can be more easily effected with it—at least it is not so in my hands. I am not arrogating too much to myself when I say that I have had some considerable experience in instrumental cases; I can conscientiously affirm that I entered on practice quite unprejudiced as to the relative merits of the two instruments; and I have found it, in

* One of the first celebrated, and perhaps the most strenuous, of all the advocates in this country, for the vectis as the preferable instrument, was Dr. Bland. His arguments will be found in a paper by him, published in the second volume of the London Medical Communications, in the year 1790, p. 397.

no few instances, easy to deliver by means of the forceps, when I had made trial of the vectis without effect. If such has been the case—as I have reason to believe it has—with others as well as myself, of what use is it to boast the easy adaptation of a power which, when properly adjusted, is so inadequate to the end proposed?—Again, we are told that, being so much more easily applied than the forceps, it is not necessary that the operator should be so perfectly conversant with obstetrical principles in general, or the particular points of the case under treatment. This, although a very specious, is, in my opinion, the most injudicious and untenable argument which could possibly be adduced in favour of this instrument:—to prefer the vectis because in may be worked by a person who knows but little of obstetric principles, is, to say the least of it, placing a dangerous instrument in rash hands, framing an excuse for ignorance, and opening a wide door for violence and injury. I cannot but think that man highly culpable who would attempt to introduce the vectis without knowing minutely the bearings of the case under his care, or who was not sufficiently acquainted with the principles of obstetric science to enable him properly to adapt the forceps. Such a man would compromise his patient's safety, to say nothing of his own character. The *fourth*, and last, is the only argument which with me carries any weight in support of the vectis—that it can be used in cases where the short forceps is inadmissible, owing to the principal bulk of the head remaining above the pelvic brim: it is a longer instrument, and in its application passes higher within the woman's person than the short forceps, being received somewhat, indeed, into the cavity of the uterus itself; but to overcome the difficulty of such a case, we are in possession of a much more efficient, and, in my opinion, even more safe instrument, in the long forceps: so that either with the long or the short forceps we may surmount all the impediments to which the vectis is applicable, under vertex presentation.

Positive advantages of the forceps.—Besides these negative advantages, the forceps appear to me positively superior to the vectis in many respects. *First*, when we have applied the blades fully over the ears, we can generally turn the head into that direction most convenient for its exit. It has been already shown that if the face be coming forward, towards one or other groin, we may, perhaps, find it necessary to turn it into the hollow of the sacrum before we can accomplish extraction, and that this turn can be effected with no very great difficulty; but we cannot do this with the vectis—we can only extract the head in that situation under which it is attempting the passage. *Secondly*, we can compress the head with the forceps, and diminish its lateral diameter so as to enable it to escape through a somewhat contracted aperture. It may be answered, that this

can be effected with the vectis also; but when the head is compressed between the two blades of the forceps, the pressure is taken off from the mother's structures; should the vectis, however, be employed, the counter-pressure is made by the bony pelvis itself, and the soft parts lying between the head and the pelvic bones must suffer more or less from contusion. *Thirdly*, we are not in so much danger of injuring the mother, because, with the forceps, we have a fixed fulcrum, and consequently there is no necessity for us to form one for ourselves. To this observation, again, it may be answered that the instrument should be used as an extractor, and not as a common lever; and that therefore our argument is unfair, as being deduced from an abuse of means. In reply, I would observe, that the instrument is so much more easily used as a lever of the first than of the third species, and the fulcrum is so much more naturally made by the bony pelvis than her own hand, that in our anxiety to accomplish our object,—however determined we may be to the contrary,—we run a great risk of transgressing the rule, and endeavouring to *scoop* the head out. It will, of course, be understood that these remarks apply to young operators, and not to experienced practitioners.

These three principal advantages, then, of the forceps—the being able to turn the head in any direction,—their producing compression and diminution of bulk, without bruising the soft parts, and the comparative safety with which they may be employed—induce me to use them, and strongly recommend them, in preference to the vectis. There are only three cases in which I think the latter instrument preferable; under presentations of the brow, face, or side of the head—the ear, for example. In brow presentations the instrument may sometimes be advantageously used—being passed over the occiput—to bring down the vertex, and prevent the case being converted into a face presentation; but this is seldom requisite, and can only be effected before impaction has occurred: and where the face presents, and the head has become impacted in the pelvis, the case is more likely to be easily terminated by the adaptation of the vectis, as shown in Plate XXXIV. fig. 102, than by the forceps: and the same remark holds good in regard to presentations of the side of the head, Plate XXX. fig. 91.

FILLET.

The fillet or *lacque*—an instrument now very properly discarded from practice in head presentations—deserves but very little consideration. The first mention of such a contrivance occurs in the writings of Rhazes,* about the end of the ninth century, and became known under the name *laqueus*. It consists of a strip of strong cloth, silk, or leather, formed into a running noose, and was sometimes sewn up like an eel-skin, open at both ends, to admit the introduction of a piece of whalebone, cane, or wire, throughout its entire length, by which its application might be facilitated. It was intended to be introduced over the head in whatever way was most easily accomplished; and this done, the cane was to be withdrawn, the loop tightened, and extraction was to be effected by main force. We cannot suppose that the fillet could retain its hold unless it was actually passed over the chin, or round the neck; and if fixed in the latter position, it is very evident that the traction would have a tendency to double the neck upon itself, to turn the head to one side, and to form a most difficult and complicated case out of one which might, perhaps, have been terminated by the efforts of nature alone; because the power obtained could only be employed in one direction, and that in a straight line downwards.†

* Smellie's Midwifery, Introduction, p. xxxiii.

† I have never personally known this invention applied to facilitate a lingering labour; and I believe the last time it was used in London is recorded by my friend, Dr. Merriman, (Synopsis, p. 289,) in a case where his uncle was an unwilling spectator of the highest degree of violence inflicted by this instrument, in the hands of a French physician. The force employed on that occasion was so great, that the head was severed from the body, and the poor woman, as might be expected, died on the second day after delivery. Smellie gives a plate of what he considers the best specimen of the fillet, communicated to him by Dr. Mead; and states, that it may be employed, provided the forceps are not at hand. In this recommendation Smellie must have merely followed the fashion of the day; for his consummate knowledge of the mechanism of parturition taught him that such a contrivance could not be introduced if the head was impacted in the pelvis; and he was aware, also, that even if adjusted in the most fortunate manner, it could not favour the necessary turns, but was merely calculated to act on the application of brute force.—Vide Treatise on Midwifery, vol. i. p. 218. It is worthy of remark also, that Smellie neither delineates nor speaks of the vectis in any part of his works; by which we may infer he considered it so dangerous, that he desired it should be banished from the list of obstetrical instruments altogether. This must appear strange when we consider his sanction of the fillet, which is, without doubt, both much more difficult in its application than the vectis, and much more hazardous in its use.

LONG FORCEPS.

One of the most valuable instruments employed in midwifery, under careful management, is the LONG FORCEPS, if formed according to the shape and proportions represented in Plate XXXV. fig. 103, and used in those cases to which it is particularly appropriate; for although it must certainly be regarded as more capable of inflicting injury than the shorter kind,—inasmuch as it is introduced higher within the woman's person, and its extremities are actually received somewhat into the cavity of the uterus itself,—still its powers and capabilities are such as frequently to render it a substitute for the horrible operation of craniotomy. This value I have myself often experienced; for I have extracted many children alive by the agency of the long forceps, who had been doomed to death by other parties, and who must have been sacrificed, to preserve the mother, unless we had possessed this instrument.

Although, however, the long forceps form so useful an addition to our obstetric powers, they were not generally adopted by practical men till about the commencement of the present century. Smellie, indeed, contrived a pair much longer than his common instrument, but he considered them so dangerous in use, that he hesitated to recommend them, and did not even display them in his lectures. Smellie, however, as will be shown, applied their blades in a very different manner from that which is now usually practised, and which I myself follow.

Description.—The instrument which I have formed for my own use, and recommend to the practitioner, measures, from the extreme of the handle to the tip, twelve inches and three quarters, of which four inches and a quarter from the handles, and eight and a half the blades, being one inch and a half longer in the blade than the short forceps, and a quarter of an inch longer in the handles. The greatest width between the blades is about their centre, and measures two inches and seven eighths; the points are an inch asunder. It weighs twelve ounces and a quarter. From the handles, two parallel straight shanks arise, of an inch and a half in length; and it is in the addition of this shank that the instrument differs principally from the curved forceps of Osborn, the curve of the blades springing, not from the handles, but from the extremity of the shank. The object of this addition is to prevent laceration of the perineum, in the use of the instrument; for if the long forceps of Smellie or Haighton be employed, in which the curve takes its origin from the handle itself, the mother's structures at the outlet of the pelvis must necessarily

be pressed upon unequally by the commencement of the blades, before the head has descended low enough to distend them uniformly; and thus great danger of injury must ensue. In choosing an instrument, as remarked in regard to the short forceps, we must be particular that the internal surface of the limb of each blade is slightly convex; and the joint should be loosely formed, so that the handles, when locked, should be allowed a considerable play upon each other laterally.

The instrument, delineated in Plate XXXV. fig. 103, possesses a slight lateral curve; and although I prefer a *straight short forceps*, I think the curve a useful addition to the *long* kind. In the adaptation of these blades, there is not so much risk that we should apply them wrongly, as when we use the curved short pair; for as they are always to be introduced in reference to the *pelvis*, and not to the *particular position of the head*, we cannot well mistake which blade is to be passed uppermost.

State of the parts requisite for its introduction.—As I have already mentioned that the points of this instrument are passed within the os uteri, the student will at once perceive that it cannot be used if the mouth of the womb be undilated, especially if it be rigid: for although we might be able to insert each blade separately, still, when they are closed, the two handles cannot be brought near each other without the os uteri being pressed upon, bruised, and perhaps lacerated. It would be too strong a position, to lay it down, as a general rule, that that organ should be *entirely* dilated before the instrument is had recourse to:—to such a degree, indeed, that we shall not be able to feel the least part of its disc; because there are a great many cases in which it is pinched between the head of the child and some points of the pelvic bones,—is prevented from full dilatation, by being held prisoner, as it were, by this pressure,—and, consequently, in which a great portion of its substance,—both anteriorly, towards the pubes, and posteriorly, towards the promontory of the sacrum,—can be easily distinguished by the finger; while at the sides of the pelvis it is perfectly soft, flaccid, and distensible, and quite out of the reach of a common examination. The rule which I have been in the habit of following in my own practice is, that if one-third of the os uteri can be felt *continuously*, it is most likely in a state that will not admit the safe action of the instrument.

Cases in which serviceable.—The cases in which this instrument is so particularly serviceable are, where the head has partly engaged in the pelvic brim, having descended too low to be raised for the introduction of the hand into the uterus, and the performance of the operation of turning, while at the same time it has not entered the cavity sufficiently for us to feel an ear, and where delivery has become necessary either in consequence of hæmorrhage, convulsions, syncope, or any other accidental

cause;—the os uteri being at the same time perfectly dilated, or most easily dilatable. But it is especially useful in those instances where the pelvis is slightly contracted in its conjugate diameter, measuring between the pubes and the sacrum but a little more than three inches;—where the principal bulk of the head remains above the brim,—the uterine energies being strongly exerted, perhaps, but not powerful enough to squeeze the fœtal skull through the diminished aperture;—in which either exhaustion is approaching, or there exists a well-grounded fear that the uterus may injure itself by the violence of its own expulsive efforts. In such a case, provided the os uteri is completely, or almost fully opened, with the vagina and perineum sufficiently distensible, the long forceps may be had recourse to,—sometimes with decided advantage,—and may render the horrifying operation, entailing the destruction of the child's life, unnecessary.

Mode of application.—The mode of applying the instrument differs exceedingly from that adopted when the short forceps are used. We do not apply it in relation to the situation of the child's head, but to the points of the pelvis. I have already mentioned that we adapt the short forceps decidedly in relation to the situation of the head, because we introduce each blade over an ear; but, in using the longer instrument, we apply a blade within each ilium. The woman, then, lying on her left side, the one blade will be above, the other below; and whether the child's face be directed towards the right or the left side, one is placed over the forehead, and the other over the occiput; or rather the blades are found to be applied somewhat diagonally, one reaching to the upper part of the orbit,—just to the superciliary ridge,—and the other exactly opposite to it, on one side of the occiput.* Plate XXXV. fig. 104.

* The first recommendation which Smellie gave was, that the blades, like those of the common instrument, should be adapted over the ears—one lying behind the pubes, and the other anterior to the sacral promontory; and in this recommendation he has been followed by Burns, (fifth edition, p. 441,) Baudelocque, (parag. 1806—Heath's Translation,) Dewees, (System of Midwifery, p. 324,) and other practitioners of repute; though both the latter-named authors prefer turning, if practicable, to the use of the long forceps. But he advises, also, "if the operator finds the upper part of the sacrum jutting in so much that the point of the forceps cannot pass it, let him try with his hand to turn the forehead a little backwards, so that one ear will be towards the groin, and the other towards the side of that prominence; consequently there will be no more room for the blades to pass along the ears; but if the forehead should remain immoveable, or, though moved, return to its former place, let one blade be introduced *behind* one ear, and its fellow *before* the other."—(Treatise on Midwifery, vol. i. p. 238.) This quotation from Smellie imbodies the opinion and practice of his followers, and proves how intimately versed that great physician was with the difficulties sometimes met with in obstetric surgery. The truth is, that in by far the greater number of cases under which the long forceps become necessary and useful, it is impossible to apply them over the ears, in consequence of this very impediment which Smellie has pointed out; the extremity of that blade which is introduced backwards impinges on the promontory of the sacrum, and neither force nor address will overcome the resistance offered to its progress upwards. When the pelvis is

To M. de Leurie, a French physician of some eminence, we are indebted for having first suggested the propriety of adapting the blades to the forehead and occiput. In a small work on the Cæsarean section, and the application of the forceps when the head is detained above the pelvic brim, published in 1779, he strongly advises this method of proceeding.

Two objections against this mode were urged by Baudelocque; and the merits of the new suggestion canvassed neither very fairly nor very temperately. He objects, that if the blades "be placed at the sides of the pelvis," they must be applied over the face and occiput, and that there is consequently great danger to the infant's features;—and again, he argues that if pressure be used in that direction, the bulk of the head cannot be diminished in the lateral diameter, (where, indeed, such diminution is required,) but its width must actually be augmented; because "the head being compressed one way, it must be lengthened in the other."* With regard to the first of these observations, it is founded on an erroneous idea regarding the actual position and form of the fœtal head: he seems to have overlooked the very large proportion which the cranium, properly so called, bears to the face in the mature fœtus, and to have forgotten that under labour the chin is generally thrown forcibly upon the chest, the head therefore bent very much forwards, while the vertex becomes the most depending part: in consequence of which position, the forehead, and not the face, would principally bear the stress of pressure. Besides, even allowing that the blades were long enough to cover the face entirely, provided both are of the same dimensions, the point of that which is applied over the occiput would impinge on the neck of the child, and prevent the other passing up so high as to embrace the face; if otherwise, they could not be properly locked. Even in the most recent works, however, on obstetric science, we read of the injury likely to be done to the child's face by the forceps, used as I recommend them; and by some authors† we are instructed that the blade applied *over the face* should be softly padded, as a protection to the features. I have employed this instrument on very numerous occasions, and I never, to my recollection, bruised a single feature. In general, the point of the instrument has not ascended farther than the eye-brow, or (if the head were transversely placed, instead of diagonally) than the root of the nose.

The second objection is not more difficult to dispose of than the first,

well formed, indeed, and the necessity for having recourse to the long forceps originates in any of the accidental causes just named, it may be very possible, and even easy, to apply them as Smellie, Baudelocque, Burns, and Dewees, advise; but, under a contracted state of the conjugate diameter at the brim, it is very seldom that this is practicable.

* Parag. 1804, translation.

† Campbell's Midwifery, p. 242.

for it is founded on a false assumption. There is no question that the fœtal head cannot be decreased in one diameter without being lengthened in another; but it does not necessarily follow that under the application of the long forceps, the increased capacity should be from one parietal bone to the opposite. It will be found, indeed, in practice, that the increase principally,—if not entirely,—takes place in the direction from the chin to the vertex; and that the cranium is moulded into a still longer or more conical form. Now, as this particular change in the figure of the head does not in the least interfere with its passage through the pelvis, the only consideration which presses itself on the mind is, whether it is likely to endanger the child's life; and I myself suspect, from observation, that the fœtus will not bear, with impunity, the same degree of pressure when the compressing powers are adapted over the forehead and occiput, as when applied laterally:—but this requires farther confirmation.*

I will take, then, the case most frequently met with in illustration, and suppose the patient possesses a slightly contracted pelvis. I will presume that the parts are tolerably well relaxed; that the os uteri is dilated, being not discoverable at the sides, but pinched anteriorly between the head of the child and the pelvic bones, tender and slightly swollen; that a large portion of the head has come into the pelvis in an elongated, conical shape, but that the base remains above the brim; that eighteen or twenty-four hours have elapsed since the rupture of the membranes; that the pains, which have been exceedingly strong, are beginning to flag, and that other symptoms of exhaustion are appearing:—or perhaps that they still continue powerful, but that there has supervened a violent local pain at one particular part of the uterus, constant and uninterrupted; so that we have reason to fear injury to its structure may occur, unless delivery be speedily accomplished: under such a state, if the pelvis contains more than three inches in the conjugate diameter, and is not diminished in space laterally, we are warranted in having recourse to the long forceps, and the operation must be conducted in the following manner.

The woman being placed on her left side, with the nates near the edge of the bed,—the bladder being evacuated by the catheter, and the rectum being emptied also, if necessary,—we warm and grease both blades of the instrument, and pass two fingers of the left hand under the right ilium, as high as possible upon the child's head; then, taking lightly in our right hand that blade whose convex edge is towards our left side when the back of the instrument is next our person,† we incline the handle up towards the pubes, and introduce the point backwards along the sacrum,

* See Radford's second Essay on Midwifery, p. 10, for the same opinion; and for arguments to support it.

† See Plate XXXV. fig. 103, *b*.

keeping it in close proximity to the head, and insinuating it with the same semi-rotatory, wriggling movement, before directed. When the blade is so far passed up that the point approaches near to the sacral promontory, the handle must be gently drawn backwards towards the anus, and at the same time somewhat depressed; the point will then slide up under our fingers, and the whole blade will lie flat upon the fœtal skull. Or, to avoid the necessity of the blade making a curcuit of any part of the pelvis, the handle may be depressed below the bed-furniture, and the point at once slipped up within the ilium, between our fingers and the head. This, however, requires that the nates of the patient should project considerably over the bed's edge—a posture difficult to obtain and to preserve —else the handle cannot be sufficiently lowered: and since the cavity of the sacrum is not occupied by the head, in the case under consideration, in the same manner as it is when the short forceps are applicable, there is not the same difficulty in making this partially circular sweep, nor the same chance of injury attending the change in the position of the instrument. When the first blade is properly adapted, it must be retained in its situation by our own little finger and thumb, or by an assistant, and the second must be introduced within the left ilium,—guided by the first two fingers of our left hand,—exactly in the same manner as the first, until its locking part slips into that of the uppermost blade. If, when they are both fully introduced, it is observed that the blades are not perfect antagonists to each other, and consequently that they do not lock easily, no twisting must be used to make one groove fit into the other,—no wrenching or screwing round; for it must be recollected that the points are actually received within the uterus, and that the neck and mouth of the womb may be seriously injured by our incautious efforts;—we may, indeed, do infinitely more mischief even, than if we employed the same force while adapting the short forceps:--but we must withdraw the second blade, and pass it up again in a different and more suitable direction. No effort at extraction must be made until the lock is firmly fixed. The head, then, being included within the two blades, the same cautions must be attended to as in the case of the short forceps. A finger must be carried quite around the lock, to ascertain that none of the mother's structures are trapped; moderate pressure is to be applied by our hands; and extraction must be begun.

We are sometimes told, that we must never think of having recourse to the long forceps until we have ascertained with certainty to which side of the pelvis the child's face inclines: but this information, however desirable it may be, it is not always possible to gain, even in cases perfectly adapted to the instrument: for the head is usually so high that an ear cannot be felt without passing the hand into the pelvis, and carrying

one or more fingers into the uterine cavity—a measure which would produce both much pain and some danger: while, on the other hand, from the puffy state of the scalp, the fontanelle and limbs of the lambdoidal suture can scarcely ever be distinguished; so that,—although in the earlier part of the process we might have been able accurately to satisfy ourselves as to the position of the head,—when called to a case requiring the assistance of the long forceps, that knowledge is obtained with great difficulty. And fortunately it is not absolutely necessary, for the success of our operation, that we should positively learn to which side the face is directed; for when the impediment at the brim is overcome, the head will generally of its own accord turn, with the face towards the hollow of the sacrum, without the use of any directing power on our part: so that we have only to *follow* it in its natural inclination, without attempting to *guide* it. In Plate XXXV. fig. 104, the long forceps is represented as applied when the principal bulk of the head is above the brim of the pelvis, the face being situated towards the right sacro-iliac synchondrosis; one blade is adapted over the right brow, and the other over the left side of the occiput. The head is pictured as very much elongated, consequent on the pressure it has suffered.

In making extraction, the same pendulum-like motion must be used which avails us with the shorter instrument. It must not consist of a rapid succession of short, hasty jerks, nor a strenuous and forcible swing, but of a full, slow, regular sweep from handle to handle, the lock being kept back towards the perineum as closely as is consistent with its safety, while slight traction is exerted downwards.

As soon as the head has passed the contracted brim, and has become fully lodged in the pelvic cavity, we usually find that the principal difficulty has vanished; and it then becomes a question in what way the labour should be terminated—whether we should finish it with the instruments, as first applied,—whether we should take them off, and leave the case to be completed by the natural powers,—or whether, on their removal, we should apply a short pair over the ears, and act according to the rules previously laid down:—and I think these questions can be satisfactorily answered; for each mode possesses its own advantages, according to the peculiar features of every case. If, then, the uterus be acting but feebly, either from exhaustion or any other cause, while at the same time the outlet of the pelvis is of the ordinary capacity, and the vagina and external parts are soft, flaccid, and distensible, we may terminate the labour at once by continuing to extract with these instruments, without changing their position, because there is little risk of injury; and if the remainder of the case were left to nature, much time might unprofitably glide by, before its completion. If, on the contrary, the pains are

still strong, while the external parts continue rigid, the outlet of the pelvis being well formed, it would be better to remove the instruments, and to trust the conclusion of the labour to nature's unaided efforts. But should the inferior aperture partake of the distortion, whether rigidity of the soft parts exist or not, we might then, on the withdrawal of the instrument, apply the short forceps over the ears, and cautiously and tenderly terminate the case through their agency: and I give this latter recommendation because of the probability that nature will not herself complete the delivery, and because the short forceps are much less likely to bruise or lacerate, being applied over the side of the head, than the long, which are adapted to the occiput and brow.

Cautions.—There are some cautions necessary in the use of the long forceps, from which the shorter kind are exempt; they principally are—*First*, that we should not apply them in a case where great distortion exists. It has been already laid down as a general principle, more than once, that, unless the pelvis possess, in its conjugate diameter, three inches of clear available space, we cannot expect a full-grown well-ossified head to pass entire; and through such a diminished aperture we are not to hope that we shall be able to extract it by the forceps. Burns,* indeed, fixes the limit of the deformity which would indicate the use of the long forceps at that space. Davis,† from the observations he has given us, would lead us to believe that rather more was generally required than that which Burns specifies; and I am inclined to think that unless the pelvis measures at least three inches and a quarter, we shall generally be foiled in our attempts at delivery; or, at least, be disappointed in our hope of extracting the child living.

Secondly—In introducing each blade, we must be particularly careful that the point slides within the os uteri, and does not run up between the vagina and the neck of the womb, lest we should bruise or lacerate that organ at its junction with the vagina; and especially, lest, in attempting to lock the blades, we should pinch its structure between their extremities and the child's head. This mischance cannot happen with the short forceps, because the os uteri must be entirely dilated before their application; and, when the longer pair is used, may be avoided by taking care that the point is constantly kept in contact with the fœtal cranium, guided by two fingers previously inserted.

Thirdly—That we should not employ any strenuous endeavours for effecting delivery, nor work with them for too long a period continuously. The longer the instrument, the greater leverage we possess; and it must be evident that each increase of leverage augments our power: we are

* Op. Cit., p. 440. † Operat. Mid., p. 230.

not only, therefore, liable to use too much exertion; but we run the risk of making pressure upon structures less capable of sustaining it uninjured, than when we employ the short forceps. Unless, then, a decided advance be evident after a few minutes' well-directed efforts, we should desist from renewing our attempts; and we must judge of the progress we are making, by examining after each backward and forward movement of the instrument. We must most scrupulously avoid using *forcible* means. *Force*, indeed, is a word which should be expunged from the vocabulary of obstetrical phrases.

Fourthly—We must be guarded in our promises regarding terminating the labour by the means we are about to resort to; because it is impossible that we can measure the head accurately while its base remains above the brim, and it is equally impossible that we should be able to form an opinion of the degree of ossification it has acquired, and of its compressibility. In all these points we may be deceived, although we may have made ourselves acquainted with the capacity of the pelvis to the greatest nicety; and while such chances of deception exist, we must be most cautious not to add disappointment to suffering. I have myself, in some instances, been foiled in attempting to extract the head entire through a narrowed aperture, and been obliged, eventually, to have recourse to the perforator. I always feel more satisfied, however, in lessening the head after having made these attempts, because I have good reason to think that nature unassisted would seldom be able to expel a child through a pelvis of such small dimensions, as would not admit its passage by the aid of the long forceps;—provided, in other respects, the case was fitted for the employment of that instrument. I would advise the operator, then, before proceeding to act, not to make a promise of delivery, but merely to state that he is about to do something which will most probably relieve the patient materially, and that, *perhaps*, he may at once terminate the labour.

After all I have said on this subject, I must not close my remarks without coinciding in opinion with Professor Davis, that the instrument, although very powerful and valuable, is at the same time very dangerous in its use; that it should not be taken in hand except by those who have acquired some proficiency in operative midwifery; and that it is to be had recourse to, more as an experimental measure for superseding the necessity of destroying the child, than as one of the common resources of our art.

CRANIOTOMY.

Of all instrumental operations in obstetric surgery, the perforation of the skull, and extraction of the mutilated fœtus, is the easiest which could be undertaken, for delivery in any case of impacted head; and much do I fear, that to the facility with which this operation can be accomplished, have been sacrificed the lives of many children.*

It may, perhaps, be desirable in surgery, whenever necessity compels us to perform an apparently cruel operation, that the horror which the simple and bare mention of that act would inspire might be smothered and absorbed, as it were, by the sonorous and classical title which it bears; but by whatever name it is called,—under whatever high-sounding appellation it is disguised,—we cannot alter or conceal the fact that the operation consists in plunging an iron instrument into the centre of the skull of a human being, probably at that moment living, and extracting it after this mutilation has been practised.

Some, indeed, horrified at this arbitrary destruction of fœtal existence, have laudably contended that the proceeding is not justified unless the child be dead: they argue, and with truth, that human life is held at the will of one Supreme Being alone,—and that, unless forfeited to the laws, to no human hand is delegated the power of destroying it. Strong and valid would these objections be, if once the operation were performed wantonly, or without grave and deep consideration; but it is never had recourse to, except for the purpose of saving life, or preventing future misery. Did the mother perish, the fœtus within her must perish likewise; and in British midwifery we consider the mother's life as paramount;—nay, more, we think ourselves warranted in sacrificing the infant, if that be the only way to preserve her person from those dreadful lesions of sloughing and laceration, which, if they took place, must—though they did not terminate in death—render her future existence a scene of uninterrupted wretchedness.

Nor are there wanting arguments sufficiently strong and numerous to justify our practice. These are, perhaps, more the province of the philanthropist or medical jurist, than the practical surgeon: but I may remark,

* This operation has been described under various terms—embryulcia and embryousia, which have been by different authorities derived from ἐμβρυον and ὑλκω, *traho*—or ελαω, *abigo*—or θλαω, *frango*; embryotomy, from ἐμβρυον, *fœtus*; cephalotomy, from κεφαλη, *caput*; and craniotomy, from κρανιον, *calvaria*, and τεμνω, *seco*. The latter term is, I think, in most common use, and is the one which I shall adopt.

that the woman is bound to the world by many social, moral, and religious ties; she has shared the enjoyments, as well as the cares of life; she has her feelings and affections, her fears and her hopes; she is dependent on others, and others are dependent on her; when she dies, there is left a blank, which, to some surviving, never can be filled. Not so, however, with the unborn infant. Although, in dying, some personal pain may be experienced, yet the agony of mind it cannot suffer: it has no affections, no dependents; its existence centres almost exclusively in itself;—except to its nearest relatives, then, its death cannot be greatly felt. And, notwithstanding we cannot estimate life relatively, as we can any other possession,—since, with our limited comprehensions, death is shrunk from as the worst evil that can befall humanity,—yet we are surely justified, in a political, if not in a moral point of view, in preferring the preservation of the strong to the weak, the healthy to the diseased, and the mother of a family to the unborn fœtus, provided one or other must in all probability be sacrificed. From these considerations, we prefer, whenever we have a choice, the mother's safety to the infant's life; yet I would entreat the young surgeon in the strongest terms, to think long and much—carefully, deliberately, and dispassionately—before he has recourse to so dreadful an expedient as is offered by craniotomy.*

Instruments employed.—Few and simple are the means required for this dire, this terrible, this destructive and heart-rending operation; the perforator or the scissors, the blunt hook of different sizes, the crotchet or sharp hook, the craniotomy forceps, and perhaps the osteotomist, and bone forceps, are all the implements necessary. Our instruments, therefore, may

* Most of the continental, and some of the American practitioners, even now contend that craniotomy should never be performed unless there are positive indications present of the child's death. Thus, Velpeau—"L'embryotomie n'est plus admise, que dans le cas où tout annonce que le fœtus est mort, ou ne peut vivre."—(Edit. Brux., p. 444.) And Dugés says—"Le crotchet aigu ne peut être appliqué que sur un enfant indubitablement mort. Cette operation ne convient que quand on a la certitude de la mort de l'enfant."—(Manuel d'Accouch., 1840, pp. 276—278.) Baudelocque too, has this passage, in speaking of craniotomy—"Rien ne sauroit excuser le practicien, qui se comporteroit ainsi, sans avoir auparavant la certitude de la mort de l'enfant."—(Parag. 1998.) These sentiments are adopted by the German and Italian physicians; but they are diametrically opposed to British practice. They perfectly coincide, however, with the feeling expressed in the answer of the doctors of the Sorbonne, in 1688, to the question, Whether it was lawful to destroy the child for the purpose of saving the mother;—"Nous sommes d'avis que si l'on ne peut tirer l'enfant sans le tuer, l'on ne peut sans péché mortel le tirer;" for which they quote as their authority the barbarous maxim of St. Ambrose—"Si alteri subvenire non potest nisi alter lædatur, commodius est neutrum juvare." In 1755, however, the same tribunal ruled that it was lawful to baptize children in utero by means of injection; thus removing one of the objections to craniotomy in force in the Catholic countries; viz. that the child would necessarily perish eternally, unless that rite had been administered, but leaving the main question undecided. (See Astruc. Trans. 1767, p. 217.)

be divided into two kinds,—the one to perforate the skull, and the other to extract, after the necessary diminution in bulk is effected.

Perforator.—Denman's perforator is about twelve inches in length; it has a sharp point, and two external edges, from the point to the shoulder or rest; but the internal surface is blunt; it opens with a joint like a pair of scissors, and has a rest about an inch from the extremity, to prevent its penetrating beyond a certain distance into the skull. I prefer Smellie's scissors, represented in Plate XXXV. fig. 105. (*a*, front view, *b*, side view of the point,) nearly of the same dimensions, having a cutting edge both externally and within, because they are useful also to perforate the chest in cases of impacted transverse presentations, as well as for the operation of craniotomy. In choosing a perforator, we should be particular about its length; that it is made sufficiently strong not to bend under use; that the shank of the blades should not fit close at their junction, lest they should pinch the vagina when shut; that there should be no sharp edge about the joint, but that the limbs should be in every part smoothed round, and that the point should be slightly curved.*

Crotchet.—The crotchet, or sharp hook, is for the purpose of extracting the child's head after it has been opened, and is formed in the shape of a beak. The point should not be very sharp, lest it tear too easily through the bones, and injure the woman's structures, or run into our own fingers; nor too blunt, lest it should not retain its hold. Simple as this instrument appears, it is one of the most difficult in midwifery to procure good; for the least variation in the sharpness of its extremity makes a considerable difference in its value. See Plate XXXV. fig. 106.

Blunt hook.—It is desirable that we should be furnished with two or three blunt hooks of different sizes: they are also used as extractive powers, and may sometimes supersede the necessity of the crotchet, or be employed instead of that instrument, if the bones of the skull are too much loosened by putrefaction from their membranous attachments to afford a purchase to the crotchet: in such a case, the extremity of the hook may perhaps be passed into the foramen magnum, or behind an orbit. See Plate XXXV. fig. 107.

Craniotomy forceps.—Another extracting instrument, much in use in the present day, is the craniotomy forceps. See Plate XXXV. fig. 108. (*a*, represents the entire instrument, *b*, the cup blade tooth indentations

* Dr. Wallace Johnson added this curve to the extremity of the perforator: it does not increase the value of the instrument, as far as making the incision is concerned,—its only object is the preservation of our own fingers from injury; for—as the instrument is guided up to its destination along the groove between two of the fingers—if the point were quite straight we should run the risk of lacerating them; and as this form by no means detracts from its power, it is as well to adopt it.

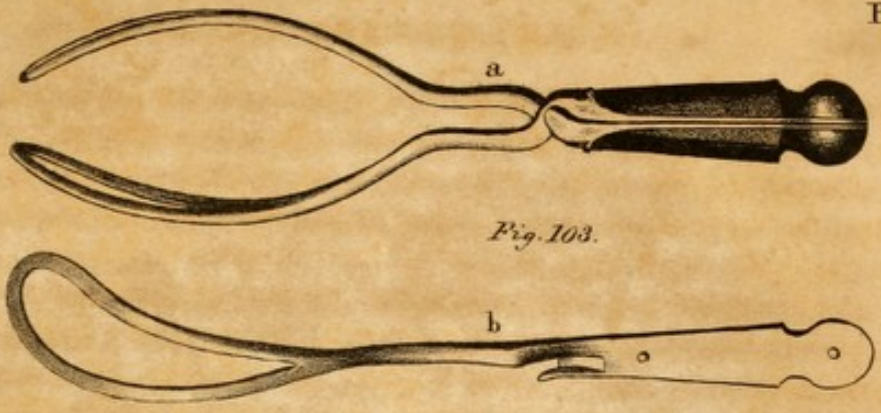


Fig. 103.

Fig. 104.

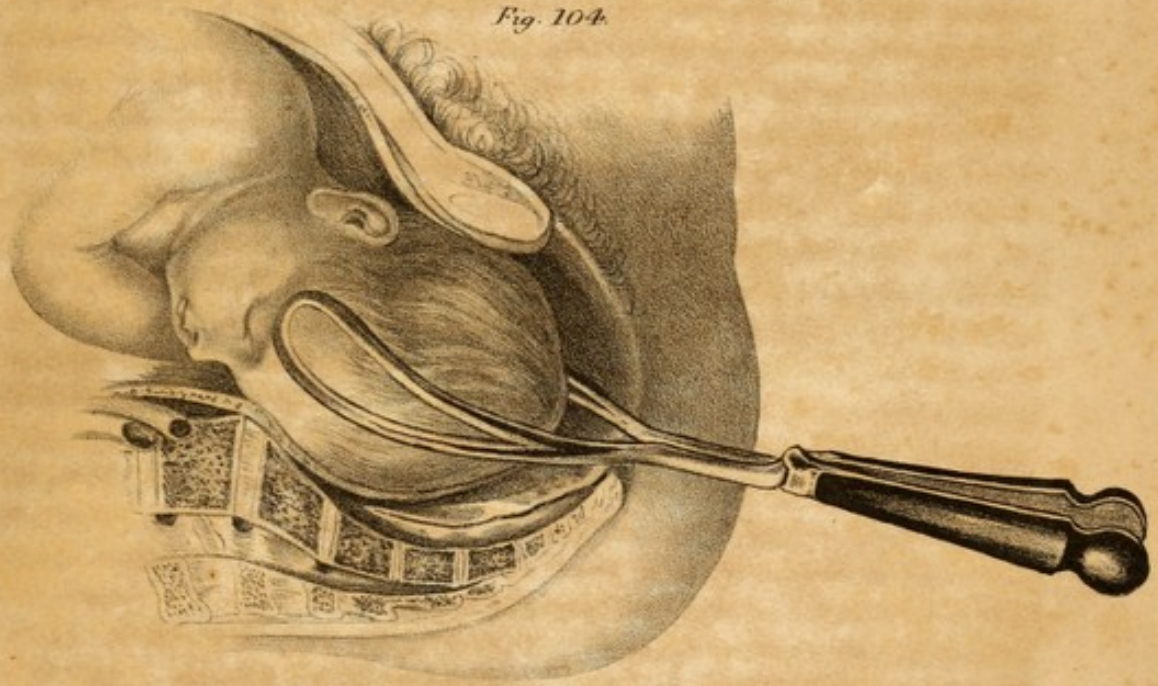


Fig. 108.

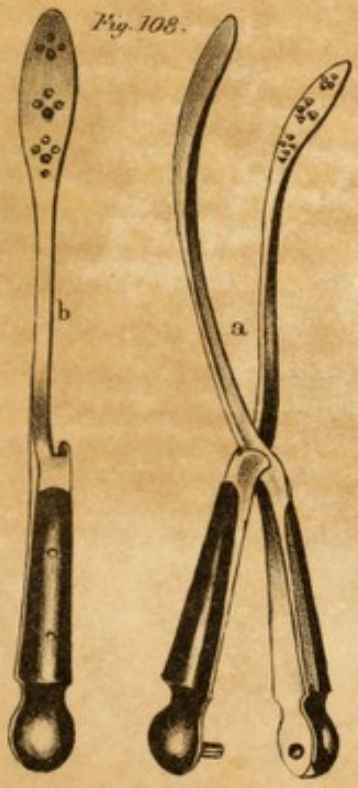


Fig. 105.



Fig. 106.



Fig. 107.



Sinclair's Lith.

to receive the teeth of the others.) This is formed of two separate blades, which are joined, after their application, by a hinge similar to that of the forceps; one of these passes within the skull, and, being furnished with teeth, perforates the bone; while the other is introduced externally to the cranium, and possesses indentations or cavities, into which the teeth of the first blade are received. When properly fixed, the extremities of the handles are to be bound firmly together by a ligature, and steady traction applied: if the bones are very strong, and the diminution of space but small, this instrument is most powerful and highly useful; but if the bones are weak, and easily give way, I cannot help considering it a more dangerous instrument even than the common crotchet; for, while the crotchet is fixed within the skull, the finger is applied exactly opposite to it externally, Plate XXXVI. fig. 111, and if the point perforates the bone, or slips away from its attachment, it cannot injure the os uteri or vagina, as it must necessarily come against our finger. But when the craniotomy forceps are employed, Plate XXXVII. fig. 113,* it is not possible to guard the structures from laceration in the same manner: their teeth are certainly well sheathed by the antagonist blade; but, in consequence of the perforations which they make in the bone, its structure is so weakened that it easily gives way; and the instrument loses its hold, and breaks suddenly out, bringing with it a portion of the skull, and perhaps some of the scalp also. This accident would indeed be of little consequence,—no other inconvenience being suffered except the loss of the purchase,—if the angles of the broken bone were always either covered by the scalp, or sheathed by the instrument itself: but this I have found by no means the case; for the irregular, jagged edges of the torn bone project beyond the margin of the blades, and—in its rapid passage through the vagina, as the instrument breaks from its hold—they are very likely to tear that organ, as well as the external parts. For these reasons I prefer employing the latter instrument, although I always carry with me the craniotomy forceps also.†

Osteotomist.—This instrument is intended to break up the bones of the child's head, particularly at the base of the skull, so as to enable the operator to extract the fœtus through a very narrow pelvis, and to prevent

* To give a full view of the pelvic cavity, the right hand only is introduced into the drawing, embracing the handle of the instrument; in practice, however, two fingers of the left hand should be kept in contact with the fœtal head, during extraction, to watch the descent and afford a degree of steadiness to the operator.

† Mr. Holmes has improved the craniotomy forceps by making the teeth in the form of the teeth of a rabbit; but this instrument has a fixed joint, and it appears to me not so capable of easy application, as when the two blades are introduced separately, and united by a joint such as is possessed by the common English forceps.

in many instances the necessity of having recourse to the Cæsarean section. Fig. 109, Plate XXXVI. represents Davis' osteotomis.

It cannot be necessary to give a delineation of the *bone forceps;* for any common pair of hinged surgical forceps, provided they are strong enough, will serve the purpose of removing the portions of bone, broken from the skull by the crotchet, or craniotomy forceps.

Cases in which craniotomy is required.—I need scarcely repeat, that although on some occasions we may feel justified in having recourse to harmless means for the purpose of delivery, before exhaustion has proceeded to any great extent, we are never warranted in taking the perforator in hand, unless driven to it by a dreadful necessity;—provided, indeed, there is any doubt as to the child's being still alive; and a well-grounded hope exists of its being expelled by the natural powers.

Many accidental causes may occasionally oblige us to resort to craniotomy—such as hæmorrhage, convulsions, rupture of the uterus, syncope, and other anomalous states immediately and seriously threatening the mother's existence; but we never adopt this method, if a safe delivery be practicable by any other. It is, however, by far most usually found necessary where disproportion obtains between the head and the pelvic bones; and this diminution in capacity we generally observe at the brim, in the conjugate diameter,—as has been more than once remarked.

I have, indeed, endeavoured to lay down a practical rule on this interesting subject, founded on actual measurement of the pelvis;* and to draw a distinctive line between those cases in which it is possible for the head of a full-grown, mature, and well-ossified fœtus, to be extracted whole, and those others where a diminution in bulk by mutilation must be practised before the birth can take place; and as a principle, we regard a pelvis possessing less space than three inches in the conjugate diameter, unequal to the transmission of the skull entire. Nevertheless, it behoves us, even under such a diminished capacity, to wait as long as is at all consistent with the woman's safety, before we employ such deadly means.

It is by no means necessary for the success of the operation, that the os uteri should be entirely dilated;—the wider, indeed, the orifice is opened, the less chance will there be of injuring that organ; but should it not have acquired a diameter greater than that of half-a-crown, we do not on that account shrink from its performance. In many cases I have been compelled to deliver by these instruments, when the mouth of the womb was not only undilated, but still possessed of considerable rigidity.

* Page 40.

Fig. 110.

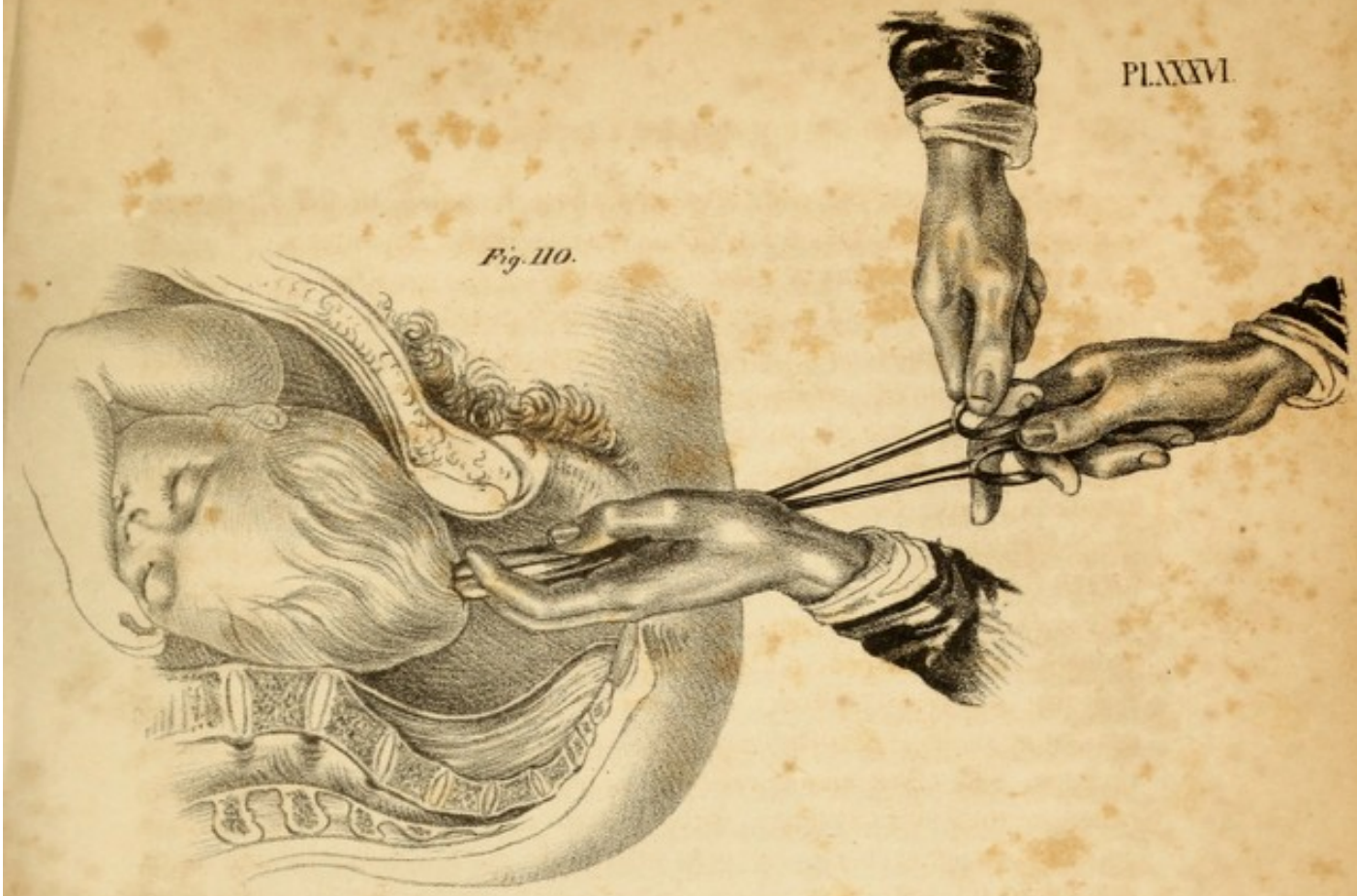


Fig. 109.

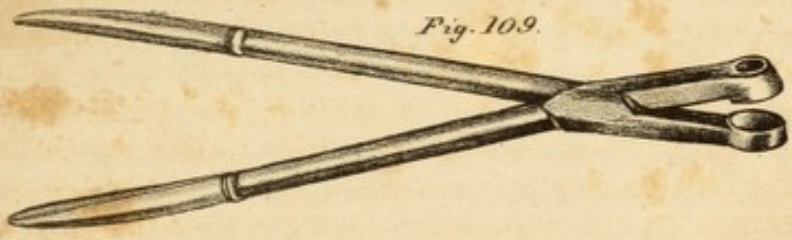
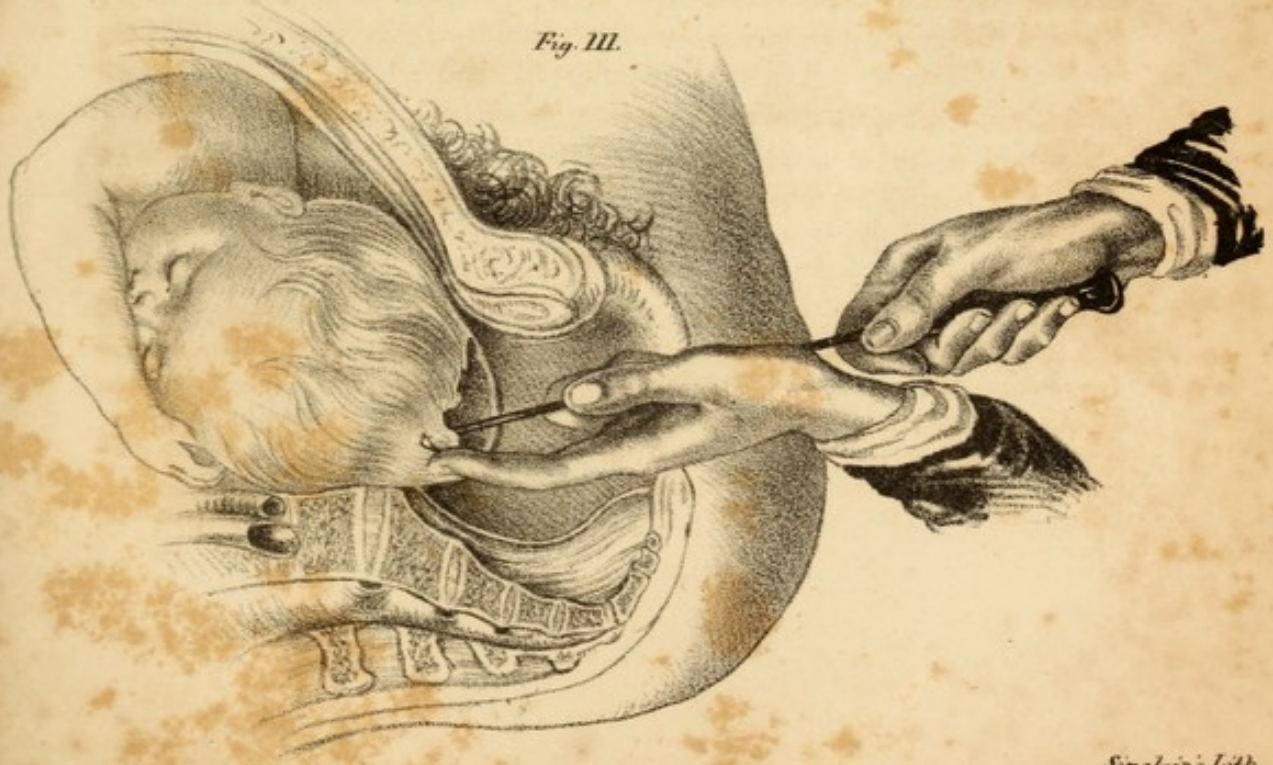


Fig. 111.



Sinclair's Lith.

Mode of performing the operation.—After the perfect evacuation of the bladder and rectum,—the patient lying in the usual obstetric position, and two or three folds of napkins being placed under her, to receive the portions of the cerebral matter as they escape,—two fingers of the left hand must be carried into the pelvis, and their tips brought to bear against the most depending part of the skull. The perforator, having been previously warmed and greased, must then be directed along the groove between the fingers, until its extremity comes in contact with the head; a rapid semi-rotatory or boring motion must be given to the instrument, and it will soon be felt to perforate the bone, and enter the skull itself; it must then be pressed onwards until the studs prevent its passing any farther.—The fingers must be separated, and the inner edges placed against the rests of the instrument. The eye at the extremity of the lower limb must be held firmly by the finger and thumb of our right hand, while an assistant is required to open the blades, by raising the upper limb to the extent of three inches. Plate XXXVI. fig. 110.* By this separation of the handles a laceration of more than an inch in length will be made in the fœtal skull. Provided the rests be well protected, there is little likelihood of any injury happening to the maternal structures; because all the cutting portion of the perforator is sheathed within the head itself. The instrument must afterwards be half turned round, without being withdrawn, and the edges directed respectively towards the sacrum and pubes; the handles must then again be separated in exactly the same manner, so that a crucial aperture may be formed in the bones. The projecting stops require now to be covered by the fingers with even greater diligence than before; for, independently of the space between the pubes and sacrum being so much less than the lateral diameter, there is greater danger of wounding the os uteri, the rectum, and particularly the bladder, while this second incision is being made. An aperture sufficiently large being obtained to admit the instrument more completely within the cranium, it must be introduced beyond the rests, and turned rapidly round in every direction, that the cerebral mass may be broken down as completely and speedily as possible. In this stage of the operation we shall find the scissors more efficient than Denman's perforator; because, by opening and shutting them, we can more perfectly destroy the organization of the brain, tear the vessels, perforate the tentorium, and even reduce the cerebellum into fragments.

* Holmes' perforator is so formed that, by closing the handles, the points are separated, and the object of the invention is to prevent the necessity of having an assistant; one hand only being required to make the aperture, while the other protects the rests. In remote situations of the country, it may be desirable to possess this instrument; but in towns and populous districts, it cannot be so requisite, because assistance is always at hand; and the amount of help we want may be afforded even by a nurse.

It is of much moment that the structures at the base of the brain should be broken up, if possible; for organic life seems mainly dependent on their integrity; and, if the fœtus does not die from loss of blood, the nerves may preserve their vitality, and perform their functions, although the principal part of the cerebrum be reduced to the consistence of pulp, or even evacuated. Instances have been known of the child breathing and crying loudly on its birth, after the head had been opened, and the brain partially extracted,*—than which no accidental mischance, in the performance of any operation whatever, I should imagine, could produce a more lively thrill of horror.

A sufficiently large aperture being formed in the bone, the second part of the operation, extraction, must be commenced. This may be effected either with the craniotomy forceps or the crotchet; but, for reasons previously given, I prefer the latter instrument,—for I have found that, if employed with due caution, it is less dangerous than the craniotomy forceps, and, if a firm hold be obtained, almost equally powerful. The crotchet, then, being introduced within the skull, must be fixed on the internal surface of the bone, wherever there is sufficient resistance to afford the necessary purchase: a finger of the left hand must be kept close upon the head externally, exactly opposite the spot on which the extremity of the instrument is fixed within: by this means its sharp point is perfectly covered, and should it even break through the bone, or slip from its hold, the finger will receive it, and all chance of tearing the maternal structures be thus prevented. Extraction must be attempted by a steady power downwards, applied in the direction of the axis of the pelvic brim, which is in a line from the umbilicus to the coccyx.

If any jerking movement be resorted to, the bone will certainly be broken, and the purchase lost. It is most probable, but not desirable, that after the continuance of exertion for some time in the same position, the point of the crotchet will perforate the bone, and be felt naked by our finger; Plate XXXVI. fig. 111; it will then be of little avail to continue our extractive efforts, without changing the situation of the instrument, because that portion on which it has been fixed will soon separate, and it will consequently tear itself away,—but a fresh purchase must at once be sought at some other part of the skull, and the same steady efforts used to overcome the difficulty.

If the pelvis be considerably contracted, we may expect that much exertion will be necessary, and much time will be spent, before the head passes through the brim; and we must not be disappointed in finding the bones break constantly, and piece after piece come away. The loosened

* See Med. Chirurg. Review, January 1834, p. 204.

pieces must be carefully removed, either by the fingers or a pair of small forceps contrived for the purpose, and the naked edges, still remaining within the vagina, studiously covered by the scalp. In this manner the parietal, the greatest portion of the frontal, and parts of the occipital bones, may be brought away; and the orbits, or the foramen magnum, will then afford a strong, and most valuable hold either to the crotchet or blunt hook. Should the blunt hook slip, as it will often do, or the crotchet too easily destroy the texture of the bones, recourse may be had to the craniotomy forceps, the greatest care being taken not to enclose any portion of the os uteri between the blades, and the other dangers to which I have before adverted being borne in mind.

Another great objection to the craniotomy forceps consists in the difficulty of their re-adjustment when they have broken from their previous hold; for it is not always easy to find a fresh purchase on which they can be applied without injury. The guarded crotchet of Davis will sometimes, perhaps, be useful; but I cannot help thinking the best security the patient can experience is in our own caution, and the best guard we can employ, our own finger.* Plate XXXVII. fig. 112, represents one form of Professor Davis's guarded crotchet. (*a* represents the instrument closed, *b* the crotchet blade which is to be fixed on the *outer* part of the skull.)

It is recommended by some practitioners, that we should endeavour to break up the cranial bones on all occasions where this operation has become necessary, and take them away separately, as soon as we can accomplish it. With these instructions I cannot coincide; because I have found that when they have been easily separable from each other, in consequence of a high degree of putrefaction having taken place, the operation was both more difficult and more dangerous than when they possessed a firmer texture, and offered more resistance. As the head collapses in its passage through the brim, the brain oozes out of the opening we have made, and the appearance of cerebral matter externally is almost a sure sign of the child's descent: it will be received on the napkins previously applied, which should be removed occasionally, and others substituted, attention being paid that none of the pulpified mass be strewed over the bed-furniture, or fall upon the floor.

There can be no necessity, in the generality of cases, for the introduction of a *spoon* within the cranium, or any other kind of scoop, for the purpose of extracting the brain; because if that organ be broken down, and the membranous septa within the skull be divided, it will readily escape when our extractive effort is applied.

* It happened to me, on two occasions, to destroy the skull so entirely, that both the orbits and the foramen magnum had given way, and nothing was left which would afford a hold to any of my instruments. In these cases I delivered eventually by turning, not without subjecting the patient to considerable hazard.

Some have advised that, after perforation was effected, many hours should be allowed to elapse before extraction was attempted, that time might be given for the bones to collapse; and that the diminished head might accommodate itself to the irregularities of the pelvic apertures.*

From this recommendation, also, in the generality of cases, I dissent, because, if we have delayed operating until symptoms threatening exhaustion have appeared, we cannot expect that the uterus will retain sufficient power to accomplish the delivery, or even to propel the head into the pelvic cavity:—besides, in so acting, we are lessening the chance of recovery which the patient enjoys, by adding to her present sufferings, and allowing her system to become hourly more depressed; we are also rendering the operation more difficult, by losing the advantage of whatever energy may still remain to the uterus; and perhaps, also, by permitting putrefaction to take place; under which state the bones will be more or less loosened from their attachment to each other, and the purchase they ought to afford necessarily weakened. If, then, we subject our patient to such an increase of danger, and render the operation so much more difficult, especially as we have inflicted the *summa injuria* upon the infant,—what advantage can we gain by delaying the completion of the delivery?

Such a proceeding may certainly be advisable in those more rare instances of extreme deformity, where not the slightest hope exists of the head being expelled whole, and in which early perforation is had recourse to, under the conviction of its absolute necessity. We may then, while the powers are strong and unimpaired, wait for a few hours with impunity; or probably even with benefit, as Osborn suggested; but, as a general principle, the practice is, in my opinion, to be deprecated.

By others,† again, we are recommended to seek for a suture or a fontanelle, and to perforate the head at one of those spaces, because the instrument more readily pierces the membrane than the bone. My custom is, to make the opening at the most depending part of the head,—that which is most readily touched,—because there is less danger of injuring the os uteri—because the point of the perforator is sufficiently sharp to drill a hole through the bone itself—and because, if we carry it to one side, it is very likely not to enter the head at all, but to run up between the skull and the scalp, merely separating the one from the other.

* Osborn's Essays on Midwifery, p. 233. He certainly limits this delay to cases where the head has been opened early in the labour; but he recommends that extreme measure to be resorted to, "at the beginning of labour, whenever the capacity of the pelvis is only two inches and three quarters, or certainly less than three inches," in the conjugate diameter,—a practice which, for reasons before adduced, I considered most unjustifiable,—provided the space between the pubes and the sacrum approaches near to three inches.

† Baudelocque, par. 1918, Heath's translation, recommends that a suture should be opened if possible.

Fig. 114.



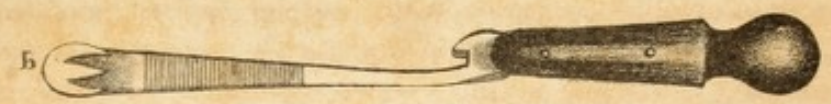
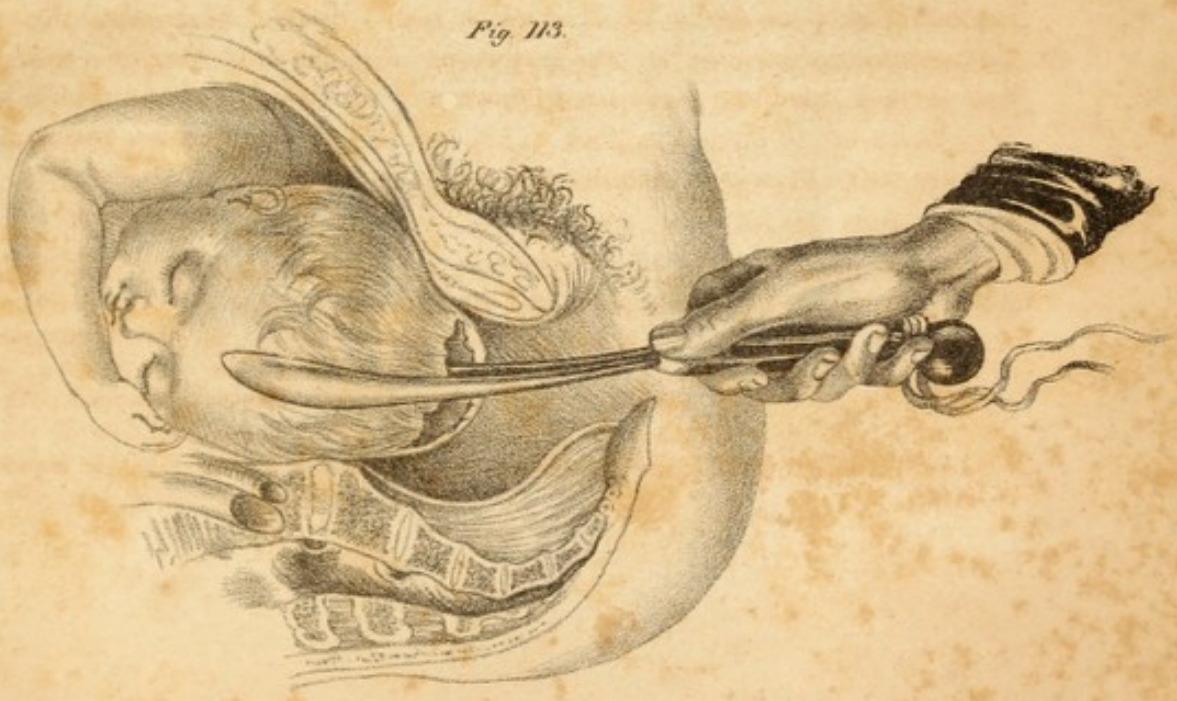


Fig. 112.



Fig. 113.



Sinclair's Lith.

On the head being born, it must be enveloped in a napkin; and it is most probable that a continuance of our efforts will be required for the extraction of the shoulders. If much difficulty exist, we shall be assisted by placing another napkin round the neck; and traction must be used in the direction of the axis of the brim, viz. in a line tending towards the coccyx. It may often even be necessary to introduce a small blunt hook under each axilla in turn, to facilitate the exit of the shoulders; and sometimes, also, to perforate the chest or abdomen, before delivery can be completed.

Baudelocque* counsels that after extraction we should inject the uterus with warm water, to wash away any particles of brain which may be lodging in that cavity, or in the vagina: this, also, I deem useless; because none of the cerebral substance escapes into the uterus, and what lies in the vagina must be perfectly wiped out by the passage of the fœtal body: as forming an unnecessary complication of the operation, therefore, this advice should be rejected.

Signs of the death of the fœtus.—It is highly desirable,—as well for the purpose of regulating our practice, as to prevent our feelings being wounded without cause, in case the child should have already lost its life,—that we should be able to determine whether the infant be dead or still living. Many symptoms have been noted as indicative of the loss of fœtal vitality —most of them very equivocal, but some few tolerably certain.

Those signs on which we can place the least reliance are—*First*, the loss of fœtal motion. *Secondly*, a sense of dull weight experienced by the mother in the uterine region. *Thirdly*, a sense of coldness in the womb. *Fourthly*, the meconium coming away under a head presentation. *Fifthly*, a putrescent fœtor in the discharges. *Sixthly*, discharge of flatus from the uterus. *Seventhly*, want of cerebral pulsation.

Those which are much more satisfactory, and which, indeed, with some limitations presently to be mentioned, may be considered conclusive, are—*First*, loss of pulsation in the funis. *Secondly*, desquamation of the cuticle. *Thirdly*, looseness of the bones, and breaking up of the texture of the cranium. *Fourthly*, emphysema of the scalp. *Fifthly*, stethoscopic observation.

We often hear it advanced, that the child must be dead, because its movements have not been felt for a length of time; and the mother herself will be persuaded that such is the case; but it by no means follows that the child should have lost its life, although no motion may have been experienced for a number of hours. I have already mentioned my belief,† that, under the compression which the brain suffers in labour, the fœtus is

* Parag. 1,921, Heath's translation.

† Page 34.

thrown into a state of partial stupor; during the continuance of which it is incapable of moving its limbs, and consequently cannot make any impression on the mother's sensibility. The brain, indeed, will bear with impunity much greater pressure before birth than after breathing life has commenced, because the action of the heart is less dependent on the nervous energy being sound and unimpaired, than is the function of the respiratory organs: compression, then, may have occurred to such an extent as to take away all power of motion, without so far interfering with the function of the brain as to suspend the heart's action. M. Merat,* too, has shown, by many highly interesting experiments, that the vitality of the heart in the newly-born animal is much less dependent on the perfection of the nervous system, than after breathing life has been continued for some time; and from these experiments it may also be inferred that the heart of the fœtus *in utero* is more independent of that system than it is after birth. Besides,—putting out of our consideration the probable effect of pressure on the brain,—if we recollect how the child's limbs are cramped after the membranes are ruptured, we shall no longer wonder that they are inactive. Its body is firmly embraced by the contracted fibres, and it is by this confinement prevented moving in any direction.

A dull sensation of heaviness in the uterus has been enumerated as a second sign. It is alleged, that as long as the child is alive there is a certain degree of buoyancy about it, which is lost when it is dead; and that a feeling of weight is consequently experienced. But this at the best is very questionable.

A sense of coldness in the uterus is given as another sign. It is supposed that so long as the child is alive, it forms heat for itself, through the medium of its own circulation; but when it is dead, it abstracts heat from the mother's body, and therefore that she must feel a sensation of cold. It is very possible that this position may be correct, but it does not follow that the inference is a true deduction, and—inasmuch as these signs are all dependent upon the mother's sensations, and consequently upon her sensibility, and as we cannot depend upon the accuracy with which she describes her feelings—we could not rely upon their infallibility, even were they much more positive than they really are.

The coming away of the meconium, when the head presents, is assigned as another evidence of the child's death. It is assumed that the bowels do not naturally evacuate themselves into the uterus; that their contents cannot be squeezed out by the action of the uterine fibres; but only pass in the last death-struggle of the child, or after the sphincter has lost its opposing power. That this does not always hold good I have myself had

* Dict. des Sciences Médicales, vol. v. p. 452.

sufficient proof: besides, a mistake may easily be made on this subject. I have already mentioned, that, generally, a brownish, olive-coloured discharge escapes from the uterus in greater or less quantity, under lingering labour, which has been looked upon as meconium mixed with the liquor amnii; and I have known such an appearance adduced more than once as a proof that the child was dead, when it has afterwards been born strong and healthy.

The discharge possessing a putrid odour, is said to be another proof of the infant's death. If the child be putrid, unquestionably the discharges will have a fœtid smell; but it does not follow that the child should be putrid, even though the fluids escaping from the uterus possess an unpleasant fœtor. The discharges may have been pent up within the womb, owing to the head being impacted in the pelvis; and a few hours will be sufficient to induce putrescency. Nay, the liquor amnii has been sometimes observed, at the commencement of labour, to possess a putrescent smell, when the child has been born vigorous. I grant that the odour arising from the mere putrid discharges differs considerably from that emanating from the body of a fœtus dead in utero; and it is very possible that a person, much engaged in operative midwifery, might be able to discriminate between them;—of the two, that arising from the death of the child is by far the most sickening: it is, indeed, the most nauseous fume that can possibly assail the nostrils. On some occasions I have with difficulty restrained myself from vomiting, while extracting a putrid child; although from habit I am not very susceptible of such impressions.

A discharge of flatus from the uterus may be regarded exactly in the same light as the appearance of putrid fluid. This gas is generated by putrescency, and will often escape, on the opportunity being given to it, when the finger is carried up to the brim of the pelvis by the side of the child's head. This, therefore, must be ranked as another most equivocal symptom.

Nor is the inability to discover pulsation through a fontanelle more conclusive. Even at an early period of the labour, when the brow presents, it is very seldom indeed that we are able to distinguish the pulse of the cerebral vessels: how much more difficult, then, must this means of diagnosis become, when the smaller, posterior fontanelle, is the depending part; and especially when the scalp is tumid and puffy, owing to the collapse which the bones are suffering.

The symptoms more to be depended upon are, first, the funis having prolapsed before the head of the child—having remained without pulsation for a considerable time, and having become cold and flaccid. Here we have a positive proof that death has taken place. But does it necessarily follow that the funis belongs to that child whose head is at the

pelvic brim?—Is it not possible that there may be twins in utero?—Is it not possible that both the bags of membranes may have given way, and that the funis of the second or uppermost child may have prolapsed by the head of the first?—If so, might not the first child be alive, though the second was dead?—It is very *possible* that such should be the case; but, to produce such an accident, three circumstances must concur—there must exist a plural gestation; the liquor amnii of both children must be evacuated; and the funis of the second must be preternaturally long, to have so dropped down. It is a most unusual occurrence for the membranes of a second child to burst before the first is born; and the prolapsus of the funis belonging to that child, at the same time, would be such a rare complication of chances as to remove the case entirely out of all calculation: so that we may safely regard the fœtus as dead, if the pulsation in the prolapsed funis have entirely ceased for the period of thirty or forty minutes.

Another almost unequivocal sign is desquamation of the cuticle. If, under a head presentation, we can bring away, between our fingers, three or four hairs having some of the cuticle attached to their roots, we may be pretty well assured that the child is dead. But even this is not an infallible sign, for there are cases on record to prove the contrary. A slough may have occurred in the scalp, from long-continued pressure while the child was still alive; and from such a spot the hair and cuticle might be removed without difficulty. Hamilton* used to mention a case of this kind; Baudelocque† also quotes one; and Dr. Orme‡ met with another, where, in consequence of cutaneous disease, (probably syphilitic,) the cuticle easily desquamated. Kennedy§ too has recorded a similar instance, in which there existed "a livid discolouration of the whole body, and a complete denudation of the cuticle, to the extent of several square inches, from different parts of the surface; while the remainder of it was so easily separable as to be removed by the friction of the clothing;" and yet this child was born alive, and survived its birth several hours. Such accidental occurrences, however, are most unusual; and if, at the same time with cuticular desquamation, the discharges were very fœtid, little doubt could remain as to the child being lifeless.

A third sign is the breaking up of the structure of the head so that when we touch it the scalp feels loose, as if it enclosed a number of shells; this is owing to the brain being pulpified, and the membranes connecting the bones having become softened, and having partly lost their

* MS. Lectures, 1821.

† Translation, vol. iii. p. 161, note.

‡ Blundell's Obstetricy, by Castle, p. 552.

§ On Pregnancy and Auscultation, p. 235.

uniting power. Together with this breaking up of the structure of the head, we usually also observe the next symptom—emphysema of the scalp; which produces a crackling sensation under the fingers: and if these indications be accompanied by the peculiar fœtid odour I have just mentioned, we may be sure that life is extinct. These three occurrences, indeed, can only take place when the child has been dead some time, and putrefaction has advanced to a considerable height.

The last, and perhaps the most satisfactory means of ascertaining the state of fœtal vitality, is stethoscopic observation. Laennec's instrument has been lately used with the view of determining the difficult question of doubtful pregnancy; and, after quickening, the sounds of the heart and of the placental circulation can generally be easily heard. The same means has also been resorted to for the purpose of ascertaining whether the child be alive under lingering labour;* and promises the best results, to those who have made auscultation a study. The beat of the fœtal heart, indeed, is attended with such a peculiar, sharp, and rapid *tick*, that it can scarcely be mistaken; and the *souffle* of the placental circulation, towards the close of pregnancy is so unlike any of the other abdominal sounds, as of itself almost to form a sufficiently diagnostic sign. If, then, by the simple application of the stethoscope to the abdomen of the parturient woman, we can decide, in a doubtful case, on the present state of fœtal vitality, we shall be gaining the greatest possible advantage, without subjecting the patient to the least pain, danger, or inconvenience; and even without shocking, in the slightest degree, the most delicate or sensitive mind: since it is not required that the whole of her dress should be removed.

I have not thought it necessary to dwell upon some other symptoms which have been noticed as evidencing the child's death: such as vomiting, shivering, lividity or pallor of the face, discoloured and sunken eye, offensive breath, or extreme languor on the part of the mother; because it must be evident that all these occurrences may take place from many causes entirely referable to the maternal system, and perfectly independent of any impressions derived from the state of the fœtus. It would be a waste of words, therefore, to canvass their separate merits.

Some practitioners, indeed, think it altogether useless to form a diagnosis on the state of fœtal vitality, since we never have recourse to the operation of craniotomy except where delivery has become requisite, and where the perforator affords the only choice. This is certainly true as a principle, but exceptions to the general rule will constantly occur. On many occasions we should be inclined to endeavour to deliver by the forceps or vectis, if we had any suspicion of the infant being still alive, although,

* Kennedy, Op. Citat. p. 242.

perhaps, in so doing, we might subject the woman's structures to some hazard; while on others we should be perfectly warranted in lessening the head, though the case might possibly be terminated by one or other of those instruments—provided, indeed, we were quite certain of the child's death.

Although it is often difficult to distinguish whether the fœtus be still living, *before* the operation is performed, that knowledge is easily gained *after* perforation is accomplished; for, if the heart be acting, as soon as the cerebral vessels are ruptured, a quantity of fluid blood, partly arterial and partly venous, will escape externally, before any portions of brain appear; on the contrary, if the circulation have quite ceased, no *flow* or *jet* of blood will take place, but a number of small clots will come away with the cerebral matter, as it oozes out on the application of our extractive efforts. We shall observe also, on the birth being perfected,—if the fœtus was alive,—that its whole person, but especially the face and lips, present an exsanguined look, in consequence of the cuticular vessels, as well as those supplying the internal parts, being drained of their contents: and this bloodless appearance has led me to suppose, that death under these circumstances occurs more frequently from the hæmorrhage which it has sustained, than from the injury inflicted on the brain itself.

These remarks, however, are of no importance, practically, in regard to the case under treatment; because, whether the child were dead or not, the act cannot be recalled; the observation is only valuable for our own satisfaction—to bring peace to our mind, and soothe our excited feelings should we fortunately ascertain that we have not ourselves been the instruments of death, but that it had occurred from the hand of nature;—and to determine the correctness or fallacy of our previously formed opinion, in respect to the child's state.

Four different means have been adopted for the purpose of superseding the necessity of resorting to craniotomy;—they are the *Cæsarean operation;* the *section of the symphysis pubis; controlling the growth of the fœtus in utero;* and the *induction of premature labour.*

THE CÆSAREAN OPERATION.

This consists in dividing the abdominal parietes, cutting into the cavity of the uterus, and extracting the child, placenta, and fœtal membranes, through the incision thus made.*

* Rousset gave the term *Cæsarean* to this operation;—Hunc nostrum partum *Cæsarei* nomine inscripserimus.—(Bauhine's Trans. chap. 1.) And he adopted it from Pliny's statement, that

There is no history in the earlier writers on medicine or surgery of any fœtus having been extracted from the uterus of a woman while alive, by this operation; and the date of its introduction cannot be traced farther back than the sixteenth century.

Rousset, in 1581, published a work in Paris, with the title ὑστεροτοκοτοκία, in which he strongly advocated the operation, and gave some cases of its performance. This work was translated from the French into Latin, in 1601, by the celebrated Caspar Bauhine, professor of medicine at Brazil; and it was chiefly through that publication that the Cæsarean section became so frequently resorted to in France, and other parts of the European continent after that period. The first successful operation, according to Bauhine, was performed at Siegenhausen, by a cattle-gelder named Alespachen, on his own wife, about the year 1500. She afterwards bore several children naturally.*

I have already stated,† that out of nearly thirty instances in which the Cæsarean section has been resorted to in the British Isles, in three only has it proved successful, as far as the preservation of the mother was concerned; and I have endeavoured to account for the great disparity in the result between these and the continental cases. I have also attempted to lay down a rule, limiting the instances of pelvic distortion, or tumours, in which it may be necessary; requiring it at the same time to be borne in mind that in Britain we never substitute it for craniotomy by choice, but only have recourse to it when no other mode of delivery is practicable.

Mode of performance.—The patient need not be removed from the bed; but lying on her back, with her head and shoulders raised by pillows, she should be brought to the edge, so that her feet may hang down towards the floor. The membranes having been ruptured *per vaginam*, if the liquor amnii is not already evacuated, the bladder perfectly emptied, and the apartment brought to a temperature of at least eighty degrees of Fahrenheit's thermometer, an incision of about six inches in length must be made through the abdominal parietes below the navel, parallel with the linea alba, a little on the right or left side of that line; to be determined by the conveniance of the operator, and other circumstances of the case. Another incision, similar to the first, must be made into the cavity of the uterus—the hand introduced, the membranes torn, and the child extracted

the first of the Roman family of Cæsars had that surname given to them, because he was extracted from the womb of his mother, when she was dying or just dead. "Auspicatiùs enectâ parente gignuntur: sicut ScipioA fricanus prior natus, *primusque Cæsarum, a cæso matris utero dictus.*"—(Nat. Hist. lib. vii. cap. 9; edit. in usum Delph.)

* Page 162, Bauhine's Translation. † Page 171.

by the feet, with all convenient speed; the placenta must be abstracted also through the same opening, as quickly as is consistent with safety.—On the uterine cavity being evacuated, the organ will contract more or less perfectly; hæmorrhage will thus be prevented, as well from the divided vessels as those over which the placenta had been attached; and there will be no need of sutures to bring the edges of the uterine wound together. The abdominal parietes, however, will require two, or perhaps three, sutures: the surfaces must be dressed according to the common principles of surgery; the heat of the apartment gradually lessened; a tolerably powerful opiate administered; and other means used to allay irritability, and avert inflammation or fever. A warm bath should be in readiness, and the proper requisites prepared to resuscitate the child, if animation be suspended.

The cautions which we have particularly to attend to in the performance of this operation, are, *first*, not to divide the tendinous expansion of the recti muscles forming the linea alba; because we should not expect union to take place so kindly in that lowly organized structure, as in the body of the muscle itself; nor to make the incision so much towards the side as to endanger wounding the epigastric artery. *Secondly*, not to allow the naked surface of the uterus to remain exposed for a longer time than can be helped, and especially not to handle the organ more than is absolutely necessary. *Thirdly*, not to make the incision at the side of the uterus; because there the largest uterine vessels take their course.—*Fourthly*, not to let much time elapse between the extraction of the child and placenta; and, *fifthly*, to be most careful that none of the intestines become strangulated, by passing through the aperture into the uterine cavity.—And the dangers which we have to fear, are, the excessive shock which such a formidable incision must produce on an unhealthy, debilitated, and perhaps exhausted frame; hæmorrhage both from the uterine vessels and those supplying the abdominal parietes, and subsequent inflammation.

It is very possible that the patient may sink rapidly after the operation, from the sudden shock experienced by the nervous system; but this has seldom occurred. Less frequently still has it occurred that hæmorrhage has destroyed; for contrary to what we might *à priori* have expected, the bleeding has generally been comparatively trifling. Hull tells us that in both his cases the loss of blood was but small.* The same remark applies to two of Barlow's† cases, although in one the placenta was attached directly over that portion of the uterus through which the incision was

* Letter to Simmonds in defence of the Cæsarean section, p. 44.
† Essays in Surgery and Midwifery, cases 1 and 3.

made; also to a case detailed by Mr. Thomson,* and to most others recorded. Lauverjat, a French author, towards the end of the last century, who performed the operation five times,—three of which cases terminated favourably for the mother,—recommends even that the loss of blood should be artificially promoted, by separating the placenta, and placing a warmed drinking glass over the denuded surface; "that such a quantity of blood may escape as is judged necessary to unload the uterine vessels sufficiently."† He confesses that this advice is very different from that previously given by those authors who had written on the subject; for they all, fearing excessive hæmorrhage, insist on the necessity of avoiding the placenta. Lauverjat, indeed, may possibly have carried his principle to too great an extent; but as he had himself operated in five cases, his opinion proves that the principal objection of Paré,‡ and others, who dreaded the excessive hæmorrhage they fancied must ensue, was speculative and hypothetical.

By far the greatest number of deaths have happened from inflammation supervening, and in some cases terminating in gangrene: such, then, is the evil we have principally to dread. It was suggested by the ingenious Dr. Aitkin§ of Edinburgh, that the injury produced on the peritoneum was the effect not so much of the violence it suffered from the incision, as of the introduction of atmospheric air into the abdominal cavity, and the irritation consequent on its admission; and he proposed—to obviate this chance of danger—that the operation should be performed while the patient was in a warm bath. I do not know that his suggestion has ever been adopted; and I am inclined to think the inconvenience attending such a mode of proceeding would render the operation much more difficult and complicated. Besides, it is very questionable whether his position be correct; for the abdominal cavity in dogs and other animals has been injected with air introduced into the tunica vaginalis, and passed through the ring, without any other inconvenience being sustained beyond what the bulk and distention produced; and it has been found that in time the elastic fluid was absorbed. From these experiments, as well as from observations on the human subject in the case of accidental wounds of the abdomen, there is good reason to think that the cause of danger is the actual incision, and not the admission of atmospheric air.

Blundell‖ suggests, if we are called upon to perform this dreadful operation, that we should endeavour to prevent the possibility of the woman

* Medical Observations and Enquiries, vol. iv.

† Nouvelle Méthode de pratiquer l'Operation Cesarienne. Paris 1788.

‡ Johnson's Translation, lib. 24, cap. 31.

§ Principles of Midwifery. Third edition, p. 82.

‖ Obstetricy, by Castle, p. 566.

again conceiving. He therefore proposes, that after the child is extracted, we should destroy the continuity of the fallopian tube on each side, by removing a small portion of its substance. By this means we should not take away desire, though we should prevent the possibility of conception.

Although in Britain we restrict this operation on the *living* subject to such extreme disproportion as must render its performance very infrequent indeed, yet the case is widely different when the mother has expired, and any suspicion is entertained of the child's survival. Should sudden death occur in labour, or during the last two months of pregnancy, it would be the bounden duty of the attendant surgeon, after having stated to the friends the probability of saving the child's life, to proceed, without delay, to extract it by the abdominal incision; and if such means were used within twenty or twenty-five minutes of the mother's decease, the result would probably be favourable.

SECTION OF THE SYMPHYSIS PUBIS.

A second means proposed for the purpose of superseding the necessity of the destruction of the child, is the division of the symphysis pubis, called, after the name of the proposer, M. Sigault—the Sigaultean operation.

It has been at different times generally supposed that the ligaments of the pelvis gave way during parturition: being impressed with these sentiments, and having imbibed the opinions of the older anatomists, "*ossa pubis tutò secari possunt,*" in 1768, M. Sigault, then a student, proposed to the Royal Academy of Paris to enlarge the pelvis under contraction, by cutting the symphysis pubis. The suggestions were referred to a committee of that learned body; and these gentlemen having taken into consideration that when the bones were separated by disease, the effects of that separation were dreadful, and that permanent lameness was the result, reported that the operation was not justifiable, but gave the proposer great credit for his ingenuity. Although, however, Sigault received such a rebuff at the outset, he was not to be deterred from his purpose; and in September, 1777, he, assisted by M. Alphonse le Roy, performed the operation on a patient named Souchôt. The operation is described as being simple; the child was born alive, and in six weeks the patient was shown to the medical faculty apparently well. But notwithstanding that the supporters of symphyseotomy boasted of the case as one of per-

fect recovery, the bladder was so much injured that she was never able to retain her urine so long as she lived.*

Denman† states, that when the accounts of the supposed success of this operation were brought to England, he had a conference with John Hunter on the subject; and it was determined, as far as the safety of the woman was concerned, that if the good contemplated could result, the section of the symphysis itself would not warrant opposition to it; but with regard to its utility, it was necessary that experiments should be made to establish that point. These experiments were afterwards made by Dr. William Hunter, and it was proved, that, by a simple division of the pubes, although the bones spontaneously separated somewhat, very little space was gained; but for that object it required that they should be wrenched asunder, to the imminent danger of the sacro-iliac ligaments and joint, and especially also to the bladder and its attachments. In cases of distortion, I have already proved that the diminution of space is principally in the conjugate diameter; and it was found that, in order to increase this diameter one inch, the pubes must be separated three inches; and to increase it half an inch, there must be a separation to the extent of two inches. It was proved, also, that if a separation of an inch and a half only took place, laceration of the sacro-iliac ligaments occurred; and it may well be presumed that this must be attended with fatal consequences.‡

It must be evident from this statement, that the operation is not justifiable in cases of the more deplorable distortion of the pelvis, and therefore, in England at least, it cannot supersede the Cæsarean section: nor is it

* Among some manuscript papers of the late Dr. Dennison, which came into my possession, I find a note that he had seen this patient while in Paris, and should have considered her quite well, "had not his nose informed him that she could not retain her urine." The praise bestowed on M. Sigault in Paris, and throughout France, was quite unprecedented; a medal was struck, by order of the faculty of Paris, bearing the motto, "*Sectio Symph. oss. pub. lucina nova, anno.* 1768 *invenit, proposuit,* 1777 *fecit feliciter J. R. Sigault, D. P. M. Juvit Alph. le Roy, D. M. P.*," to commemorate the event; a royal pension was granted to him, and the applause he received was perfectly extravagant: greater exultation he could scarcely have enjoyed, if he had devised a method to remove female nature beyond the pale of all the pains and dangers connected with parturition.—Baudelocque, vol. iii. p. 240, translation. In no other country, perhaps, but among our enthusiastic and volatile neighbours, would an operation of such a kind, resting on one solitary trial alone, have given rise to so universal a triumph. Soon it was repeated, with various success, on the continent; of forty-four women who were subjected to this operation in different countries, fourteen died, and many of those who survived were grievously injured for life; and of the children not more than fifteen were saved.—(Merriman's Synopsis, p. 168.) It has only been performed once in Great Britain; Mr. Welchman was the operator; and an account of the case will be found in the London Medical Journal for 1790, p. 46.

† System of Midwifery, chap. xii. sect. xi.

‡ See, in confirmation, the details of some interesting experiments by Baudelocque, parag. 2006 et seq., translation; and Velpeau, edit. Bruxel. p. 446.

justifiable in the smaller degrees of diminution, because in them craniotomy can be performed; and it has been laid down as a maxim, that the life even of the fœtus must be sacrificed, if that be necessary to preserve the woman's structures from such dangerous injuries as the section of the symphysis must occasion. The division of these bones, then, can neither become a substitute for the Cæsarean operation, nor for craniotomy; it is now never thought of in England, as a means of delivery, and is also, I believe, totally exploded from continental practice.*

CONTROLLING THE GROWTH OF THE FŒTUS IN UTERO.

In the lesser degrees of deformity, (putting those aside which would require our having recourse to the Cæsarean section, and which fortunately occur so rarely as to place them almost beyond the bounds of calculation,) it becomes a great object that we should be saved the necessity, for the preservation of the woman's life, of destroying each child that she conceives; and with this view the third expedient has been attempted,—*controlling the growth of the fœtus.*

It was with justice supposed that if the growth of the child in utero could be regulated so as to prevent its rapid increase, it would pass through a contracted space so much the more readily, and that this might be accomplished through the medium of the mother's system. The idea was suggested by the late Mr. Lucas† of Leeds, who adduces some instances in which a spare diet appeared to be usefully enjoined. Analogi-

* An operation somewhat similar, but much more horrible in character, was proposed by Dr. Galbiati of Naples in 1832, and performed by him in this year. The patient was only "three feet and a half and some inches" high, and the pelvis measured "about an inch between the promontory of the sacrum and the pubes, between the same and the right ilium about an inch and a half, or a little more; and between the same and the left ilium only a few lines. "The operation was commenced at 7 P. M., March 30th. The rami of the pubis and ischium of the right side were sawn through, as near the acetabulum as possible, and the symphysis pubis divided; as the space thus gained, however, was found to be insufficient for the head's descent, and 11 P. M., April 1st, the bones on the left side were cut in the same manner as had been done on the right, and the head was brought down into the pelvis by the forceps. The child was now discovered to be dead, and the case was therefore terminated by destroying the texture of the head. The woman died on the 3rd, at 5 A. M. The operation was sanctioned by other practitioners.—La Pelviotomia ragguaglia di una nuova operazione di chirurgia che puo con vantagio sostituirsi alla Cæsarea,)—Gen. Galbiati Napoli, 1832.

† Mem. Medical Society, London, vol. ii. p. 412.

cal reasoning was brought to bear on the question; and it was argued that if cows were kept in a luxuriant pasture, their calves were much larger and stronger than if their food was less plentifully supplied. Abstinence was therefore recommended in the human subject. This possibly may be the case with cows; but even if it be, the principle unfortunately, does not hold good with regard to our own species: both the observation of disease, and direct experiment, prove the contrary. We observe that women labouring under the last stage of the most debilitating diseases, such as phthisis, often bring forth plump and well nourished children. We remark, also, frequently, that the vomiting which usually attends the first weeks of pregnancy continues almost uninterruptedly during the entire period, so that scarcely the whole of any meal is retained upon the stomach; and that the patient becomes much emaciated under the debilitating effects consequent: yet the nutrition of the fœtus is not interfered with; but it is born strong, hearty, and of full size.* But the question has been settled by experiments made directly for the purpose; and it has been shown beyond a doubt, that whatever influence the regimen adopted by a pregnant woman may have on the development of her fœtus, the system of diet cannot be reckoned among the resources of our art, to be depended upon in the least degree.

INDUCTION OF PREMATURE LABOUR.

Nature herself first pointed out the most likely means to remedy the evils which disease had entailed. It could not but be observed that when women with small pelves went into labour prematurely, their infants passed with little difficulty. Thus practitioners† were led to reason on the subject and to endeavour to induce uterine action before the termination of gestation, in consideration of the amazing growth that the fœtus undergoes during the last two months, and the probability that a child born after the completion of the seventh, would be reared. Denman‡ records, that in 1756 a solemn consultation between the obstetrical practitioners in London took place on the subject, in which the morality, safety, and utility of the means, were fully discussed.

As to the *morality*, there can be but one opinion. If the life of the

* Baudelocque, parag. 1992, Heath's translation.—For the Effect of Diet on Pregnant Females, see Merriman's Synopsis p. 299.

† Dr. Macauley was the first physician in London who induced premature labour with success, in the year 1756.

‡ System of Midwifery, chap. xii. sect. x.

child can probably be saved, and if much danger can be averted from the mother, the morality, as a surgical means of procuring a great benefit, must be self-evident. Should premature labour or abortion be induced, to screen an individual from the just reproaches of the world, or to cast into oblivion the evidence of the gratification of a criminal passion, then, indeed, is murder committed in law and reason: but as our object, under the circumstances now treated of, is to save life, and as probably two beings may at the same time be preserved to society by the means proposed, the profession now entertains no question as to its morality, when imperious necessity dictates it.

With regard to the *safety* also, all must be agreed; for how much more likely is the woman to survive, having passed a fœtus, after a comparatively short labour, which may weigh five pounds, or five pounds and a half, and but little ossified, than if she produce one at the full time, weighing seven pounds or more, whose osseous system is well developed, after a difficult and protracted struggle, terminated too by instrumental delivery!

The *utility*, indeed, as far as regards the preservation of the child's life, becomes a separate question; and Baudelocque* has reasoned speculatively against it. The strongest argument he uses is, that when the liquor amnii is discharged after the rupture of the membranes, there must be such pressure on the funis umbilicalis and the body of the child as to destroy its life; especially as the os uteri will most likely dilate with difficulty. It certainly is true that more children are born dead, after the induction of premature labour, than if they come into the world at the full time; but provided we can snatch only a proportion from death, still our object is in a very great measure gained.†

* Parag. 1983 et seq., translation.

† Professor Hamilton states, (Practical Observations, 1840, p. 285,) that of forty-six infants thus prematurely brought into the world by his agency, forty-two were born alive; and that in one patient he performed the operation upon different occasions. Much greater success has attended Hamilton's endeavours than I can boast of. In my practice more than one-half have been born alive, and might live to maturity. It occurred to me, between the years 1823 and 1834, to be compelled to induce labour prematurely forty times. This may seem, perhaps, a very large number; and in explanation I may state that the extensive charity which has supplied the principal part of these cases, embraces the districts of Spitalfields and Bethnal Green, which parishes, I have reason to believe, contain more females with deformed pelves, congregated together, than are to be met with over the same quantity of square acres in any other part of this kingdom. When, also, it is taken into consideration, that in most of the patients the operation has been repeated, and that some have undergone it five and six times, the subjects of it will be found to be comparatively few. Out of these forty, one was a twin case; and of the forty-one children, twenty-three were born alive. But suppose even that the child should be born dead, still we are giving to the mother the best, and to it the only, chance of life; and we save the mother, at the same time, a great deal of personal suffering.

Difficulties in effecting the object.—The difficulties which we have to contend with in endeavouring to save the child under the proposed plan, are certainly great; and the following may be enumerated. *First*, the pressure on the navel-string may destroy its existence, as advanced by Baudelocque. There can be no doubt that as long as the membranes are whole, however strongly the uterus may act, the pressure on the fœtal body and funis is inconsiderable, owing to the quantity of inelastic fluid which the womb contains. But as soon as the water is evacuated, when the parietes of the uterus come into close contact with the body of the child, it is very possible that the funis umbilicalis may suffer such injurious compression as to destroy the child's life; and this will therefore be looked upon as one of the chances militating against success.

Secondly, it is observed that children more frequently present in a preternatural position, when expelled before the end of gestation, than after the full time is completed. At a particular period of pregnancy the fœtus assumes a definite posture, from which it seldom after varies. What this precise period is, I have no direct means of judging; probably it differs much in different cases; but the fact is undoubted, that *cross births* are more frequently met with under premature labour, either spontaneous or artificial, than in full-timed pregnancies. Of thirty-four children born after the induction of premature labour—which cases came under the knowledge of Dr. Merriman*—fifteen presented preternaturally, and only one of these was saved.† The same observation I have myself made, though the proportion has not been so large; for, of the forty-one children just alluded to, fourteen presented preternaturally; and Dubois‡ has stated, that in the *Maternité* at Paris, during the year 1829, and the three following, out of one hundred and twenty-two children born before the completion of seven months, in fifty-one cases the pelvis offered itself, and in five the shoulder; making a total of nearly one-half preternatural presentations. Thus, then, if the shoulder or breech present, we shall have little chance of saving the child; because,—besides the ordinary cause of danger,—the pressure on the funis umbilicalis must be great when the head

I have not been able to put the result of my practice on this interesting subject, since 1834, into a tabular form; but as far as memory will serve, I have reason to believe that the proportion of children saved during the last six years, has been rather larger than the foregoing average.

* Synopsis, p. 172.

† Hamilton looks upon this large proportion of preternatural presentations as very extraordinary, (Op. Cit., p. 283;) and states (p. 229) that out of fifty-nine cases "under his care, and that of the medical attendants of the Edinburgh Lying-in Hospital, there were only five such." Dubois' returns, Merriman's observations, and my own practice, would tend to prove it was not so remarkable as the professor imagined.

‡ Mem. de l'Académie Royale de Médecine, tom. ii. p. 271.

is passing the brim; for I presume on there being a want of space to warrant a recourse to the means used. Barlow,* indeed, states that he is induced to believe preternatural presentations are more frequently met with under distortion of the pelvis than when that organ is well formed. This remark coincides with my own observations; but how a contraction of the pelvic brim can influence the position of the fœtus in utero, it is difficult to explain, or even to imagine.

The *third* difficulty we have to contend with, is the chance of deception regarding the period of pregnancy at which the operation is performed. Women are very liable to be deceived in their reckoning; they may fancy they are advanced farther than is really the case, and their representations may induce us to bring on uterine action before the fœtus has acquired such a degree of perfection as to enable it to sustain independent existence:—or, on the other hand, the patient may have been pregnant before she was aware of it; and we may delay the operation until it is too late —until the child is of too great a bulk, and too strongly ossified, to pass through the particular pelvis which the woman possesses; and we may consequently, in the end, be compelled to resort to the operation of craniotomy; as has occurred to myself in more than one instance. Though these difficulties, then, are some drawback to our success in anticipating the proper period of labour, yet they are by no means such as would induce us to discard the benefits it holds out.

Means adopted.—Various modes, both by internal medicines and manual operation, have been proposed for the purpose of bringing on premature labour. Of these, the only positive sure method consists in the destruction of the integrity of the ovum; for when this is effected, the process of gestation is interrupted, and that of labour soon commences. The operation requires that we should possess a most accurate knowledge of the anatomy both of the ovum and the maternal structures, and be well acquainted with the state of development which the cervix uteri assumes at different periods of pregnancy; else the most serious evils may result, as is testified, indeed, by the criminal records of many civilized nations.

Some years ago I had an instrument made, of very simple construction, on the principle of the tonsil-lancet, but shaped like a female catheter, which I have been in the habit of employing with the intent of putting a stop to the process of gestation in those unfortunate cases, where the formation of the woman precludes the hope that she will be able to bear a child at the perfection of its intra-uterine maturity.†

* Essays on Surgery and Midwifery, p. 348.

† The following sentence briefly describes the mode of using it:—Duobus sinistræ manûs digitis, primo secundoque videlicet, in vaginam intromissis, index per os uteri inserendus est: deindè instrumentum, illo digito directum, usque ad ovuli membranas adferendum; quo facto

Unless a quantity of water is present between the two layers of the fœtal membranes, the prescribed method will *invariably* induce uterine action earlier or later; but should the amnion still remain entire, gestation may, and probably will, proceed uninterrupted. The time which elapses between the operation and the commencement of parturient pains, varies exceedingly. I have known the uterus begin to act in ten hours, and I have also known nearly a week pass. We usually observe that in fifty or sixty hours uterine contraction is fully established.

If it is proposed to induce labour prematurely by opening at once into the amnial cyst, the kind of instrument I have just adverted to will answer the purpose as well as any other, and, in the hands of a practitioner acquainted with the anatomy of the structures, will perfectly protect the mouth and neck of the uterus from any chance of injury. But by allowing the liquor amnii to drain away before the os uteri is dilated—which must necessarily happen when the ovular membranes are punctured—the fœtal body will be subjected to such pressure as greatly to endanger its existence. This consideration has led some practitioners* to adopt a different method.†

Could we always rely on success following the proceeding mentioned in the last note, it would, no doubt, be much preferable, both on the mother's and child's account, to the one more commonly practised; but I have found it fail in most of the instances where I have adopted it. Nevertheless, being impressed with the great advantage of preserving the membranes whole, I made some experiments with a medicine,‡ now well known, and found expulsive action soon follow its exhibition in all the instances, with very few exceptions, where I administered it.

After a great number of trials, however, I observed that, although the mothers recovered as well as if they had gone through an ordinary labour,

ejus punctum occultum dextræ manûs pollice intûs pressum tenuia fœtûs involucra facilè aperit, aqua uterina per canalem argenteum liberè fluit, partûsque dolores mox supervenient.

* Hamilton, Op. Cit., p. 284. See also Davis's Operat. Mid., p. 280.

† Ab uteri ore membranas, digito immisso, ad pollicis circiter spatium undique separant; mucum viscosum ex cervice demovent; et irritationem adeo excitatam satis esse ad partum præmaturum inducendum existimant.

‡ The following is the form I have been accustomed to use:—

℞ Secalis Cornuti recentis, in pulverem redacti, ℥iij.; aquæ ferventis ℥viij. Infunde vase levitèr clauso per semihoram, et

℞ Liquoris Colati, ℥viiss.; Acidi Sulphurici Dil., ℥ss; Syrupi, ℥ij.; Spiritus Cinnamoni, ℥ij. M. sumantur cochl. duo 4tâ quâque horâ.

Partûs dolores decem vel duodecim elapsis horis ægram vexare, et post singulas medicinæ potiones clarè augeri, sæpe inveni; aliquando etiam oriri primo potato haustu.

their systems not being in any sensible degree injuriously affected by the drug, (and in some instances between thirty and forty doses were taken,) yet that the proportion of children born still was greater than when the membranes were punctured. This I attributed to the baneful influence of the medicine upon the fœtus: I was consequently led to modify the practice; and I am now in the habit of administering four or five doses, at intervals of four or six hours, and of rupturing the membranes after their exhibition. I have generally remarked that the os uteri has become soft, and mostly somewhat opened under the action of the drug; and the increase of live births has been larger when this system was followed, than after any other which I have tried.

When necessary.—Unless deformity of the person generally, and of the pelvis in particular, exist to an extreme degree, the induction of premature labour in a first pregnancy is not to be thought of; for it is impossible to become acquainted with the *exact* size of the different diameters of the pelvis, except during labour; and in the cases ordinarily met with, no one would be justified in having recourse to so serious a measure, if he had not accurately ascertained the dimensions by personal examination—and that under the most favourable circumstances for obtaining the required information.*

* The liability incurred by every man in undertaking to bring on labour prematurely is so great that it makes it most desirable—nay even absolutely necessary—for the sake of his own character, that he should not perform any operation with that view, until a consultation is held upon the case, and the means proposed is sanctioned by some other practitioner. I would particularly warn my younger brethren against acting on the representations of the patient herself alone; and of the following two cases, one will point out the necessity of such a caution. In the year 1825, I was applied to by a woman, of whom I had no previous knowledge, to induce labour prematurely. She stated that she had lived at the west end of London, but had come to reside not far from my house; that two of her children had been destroyed, and that twice also premature labour had been induced by a highly respectable practitioner in the neighbourhood where she then resided. I wrote to this gentleman on the subject, who gave me such satisfactory reasons for what he had done, that I had no hesitation in acceding to her request. Since that time I have brought on labour prematurely for that woman on five different occasions.

In the year 1831, my father was applied to by a patient, also to induce labour. She stated that her child had been destroyed in the birth by a physician practising at the western part of the metropolis—a gentleman who holds a high rank in the profession; and that she never could bear a living child at full time. My father took the precaution to see this gentleman, that he might learn from him the particulars of the case, and was informed that the woman was believed to be unmarried, that she had placed herself under the care of a midwife, and that he had been applied to in consequence of a violent attack of convulsions which occurred during the labour; on which account alone he had thought it requisite to perforate the head. My father then refused to comply with her wishes; but she, still desirous of placing herself under his care, took apartments in the neighbourhood, and gestation was allowed to proceed to its termination. My father attended her. Some delay occurred in the labour, which induced him to request my assistance, and I delivered her of a living child by means of the

It becomes a question of very great nicety, what degree of contraction would warrant us in proposing this measure. As it has been frequently laid down as a principle that a child at full time may pass through a pelvis containing in its conjugate diameter at the brim three inches, we may hope, if the aperture exceed that dimension, that the fœtus may be born living, naturally, provided the outlet be well formed: and with this space we should not be inclined to adopt any means by which gestation might be suspended, unless, indeed, some extraordinary circumstances called for our interference; such as the patient invariably bearing very large children, or other accidental causes equally uncontrollable.

If, then, the conjugate diameter measure a little less than three inches, we may allow pregnancy to advance to the end of eight months; if about two inches and three quarters, to seven months and a half; if about two inches and a half, it must not proceed beyond seven months; if the space be less than two inches and a half, it would be certainly unsafe to delay our means beyond seven months; and I would be inclined to induce labour rather sooner; because children of an earlier period have been reared.*

It is a prejudice as old as Hippocrates' time, that a child of seven months is more likely to live than one of eight months' intra-uterine age; and it is still in force among the common people, not only in this country, but on the continent. Such an opinion, however, is contrary to experience, as well as to analogy and all philosophical reasoning; for we should certainly expect that the longer the fœtus remained in utero, the more completely would the respiratory and digestive apparatus be perfected; and the greater capability would it have acquired to sustain an independent existence. This supposition, in fact, we find practically verified; and we should, therefore, delay our attempts until the last day which we think consistent with its passage through the pelvis entire and uninjured. Plate XXXVII. fig. 114, the principal features of which are copied from Smellie, shows a premature head passing through a contracted pelvis, and well displays the compressibility of the skull.

Other circumstances may, however, call for our interference in the manner proposed, besides diminution of the pelvic capacity: thus, if it should have occurred to the same woman, in a number of successive preg-

forceps. We found a slight contraction at the outlet of the pelvis, which was the occasion of the difficulty experienced. I have great doubts that her object in desiring to have premature labour induced, was the preservation of her infant.

* In one case I thought it right to bring on labour at six months and a half, scarcely anticipating, however, to save the child; because, having delivered the patient previously by craniotomy, I had a full knowledge of the very small size of the pelvis she possessed. Even at this early period, I found the child had acquired too great a bulk to pass entire, and I was obliged to open the head. I was afterwards told that this poor creature went to Malta with her husband, and there died in labour.

nancies, to be aware of the death of her infant at a particular period towards the close of gestation,—about the termination of the eighth month, for instance,—and if the death was to be attributed to deficiency of nourishment, or any other cause decidedly referable to the maternal system, it would become a matter for consideration whether a chance of life might not be afforded to her future infants by the induction of labour before the usual period of their death. Under such a state, however, it would be necessary to weigh most minutely every circumstance connected with the case, and all the peculiarities attendant on it.*

Other states of disease, in which the mother's life is placed in imminent jeopardy,—provided there is good reason to suppose her danger is aggravated by the continuance of pregnancy,—may warrant us in having recourse to the induction of premature labour: thus, Hamilton† used to say he had twice resorted to the expedient, with the view of preserving the mother; in one of which cases dropsy induced him, and the other, deadly exhaustion and depressed vital powers. For such anomalous cases, however, it must be evident that no general rule can by possibility be laid down.

It would be right, in every instance where premature action is induced, that a wet-nurse should be engaged to take charge of the child immediately on its birth.

CONSEQUENCES OF LINGERING LABOUR.

Exhaustion.—After lingering labours, whether instruments have been used or not, the generality of women recover tolerably well; but occasionally very bad symptoms manifest themselves, the consequence of depression from loss of power, excitement, or injurious pressure.

Sometimes the system falls into a state of exhaustion, from which it never rallies. The symptoms indicating such a condition would gene-

* On one occasion I was consulted by a pregnant woman for a small tumour at the upper part of the thigh, which was evidently of a malignant nature; it increased so rapidly, that it was clear, if she were allowed to attain her full period, it would in all probability have acquired such a magnitude as to preclude the possibility of extirpation. I requested the opinion of my father and Mr. Luke, who coincided with me as to the character of the disease,—as to the hazard of performing the operation under pregnancy,—and as to the danger of allowing the full term of gestation to arrive. I therefore brought on premature labour about the end of seven months: she was received into the London Hospital as soon after as was safe; the tumour was removed, and she enjoyed her former health. The child presented with the breech; the labour was somewhat lingering; and it was unfortunately born dead.

† MS. Lectures, 1821.

rally be observed before instruments were had recourse to: under it the mental and bodily powers are completely worn out; the pulse flags; the extremities become cold; there are weariness of the limbs, vomiting, sunken features, and a hollow eye; probably no pain is complained of, and the expression of the face is sufficient to indicate the danger. Stimulants, nourishment, cordial medicines, opium, and æther, are the best and only means to restore the ebbing vitality.

Inflammation of the pelvic viscera.—After lingering labour, the viscera, at the lower part of the abdomen and pelvis, often go into a state of inflammation: suppuration may occur, but it is not usual; the inflammation generally terminates in resolution or sloughing. This state is known by shivering, general fever, and local pain,—by a quick pulse, white tongue, thirst, heat and dryness of skin, deficient secretion of milk, and by the lochia being suppressed, or scanty and of bad odour; and there is pain on pressing the lower part of the belly. If the uterus feels large, hard, and painful, most likely the inflammation is principally confined to that viscus; but if the pain is more general, and the swelling less circumscribed, the probability is that the disease is more diffused, and there is a greater chance of its terminating in sloughing of the vagina.

Suppuration is known to have supervened by occasional rigours occurring,—by the sharpness of the pain experienced,—by the pulse increasing in rapidity and falling in power,—and by hectic fever. The tongue becomes furred; and there is purging and sweating, and vomiting, and wasting of the body: generally the bad symptoms increase, and the patient dies; but sometimes the abscess will burst into the vagina, and give almost immediate relief.

Deep collapse.—A state of deep collapse may be produced by the extensive contusions and subsequent mortification. The entire prostration of strength, the muttering delirium and watchfulness, the cold clammy extremities, the quick, weak, tremulous, and often irregular pulse, will sufficiently characterize this state; while the purgings and vomitings, and aphthous mouth, will indicate the extent of danger.

Sometimes, the parts, rather by their own healing powers than by the aid of medicine, will become restored; the symptoms will gradually abate; the different organs will slowly regain their healthy functions; and after hovering on the brink of destruction for some weeks, by a strong effort of the constitution, the patient will unexpectedly rally. At other times the parts will slough, and various will be the extent of the destruction produced. Occasionally, the bladder, rectum, and all the coats of the vagina, will become gangrenous; the three cavities will be thrown into one; and if the patient survive, of which there will then be little chance, most miserable indeed must be the remainder of her life. At others, merely a por-

tion of the mucous membrane of the vagina will slough. Constitutional irritation, varying in degree, will supervene, which will cease on the healing process being established; a cicatrix will be formed, and this will most likely impede the passage of the child during a subsequent labour; or it may even narrow the canal to such an extent, as to prevent marital intercourse.

Treatment.—Little can be done by medicine under this unfortunate condition. The parts may be fomented, and the strength must be sustained. The introduction of a piece of lint, soaked in turpentine and oil, has been recommended to facilitate the slough's separation. As soon as the patient is able to be moved, she should be sent into the country: a change from the close atmosphere of town to a more healthy air has often given a fillip to the constitution, has renovated the sinking powers, and put an immediate check to some of the worst symptoms, especially continued purging.

Inability to pass urine after delivery is not an infrequent consequence of lingering labour. It arises from turgescence of the vessels of the urethra and neck of the bladder, or perhaps from spasm of the sphincter.

The introduction of a catheter two or three times in the twenty-four hours is necessary in every case where the bladder does not void its contents. Occasionally, after an instrument has been used for the purpose, the patient, for two or three days, passes her water tolerably well; and subsequently it comes away involuntarily. Under this state, if the labour has been tedious, it is always to be suspected that a slough has taken place at the neck of the bladder, or in the track of the urethra, especially if at the same time there be a fœtid discharge, and most particularly if a small piece of membranous substance has been voided; this, on being washed, will be found to be a part of the neck of the bladder, sphacelated and separated. These suspicions may be confirmed or annulled by simply passing a catheter into the bladder, and introducing a finger into the vagina, along the course of the urethra; if any portion of the catheter can be felt naked through the vagina, a fistulous orifice has been formed, and the treatment under such circumstances must be regulated according to the common principles of surgery.

Pressure on the nerves.—Occasionally the nerves suffer; the great sciatic, which lies over a part of the sacro-iliac synchondrosis, is especially exposed to pressure, unless there be a large cushion of fat in the pelvic cavity. Pressure on this nerve, under labour, produces great pain, numbness, and cramps, and sometimes a partially paralytic state after delivery. Nerves in themselves do not possess much restorative power, although usually they regain their healthy state after labour. I never knew an instance in which permanent paralysis existed as a consequence of injury

done to a nerve under labour, though I have known pain, numbness, and inability to move freely, continue for many weeks.

Tumour on the fœtal scalp.—When a child is born after lingering labour, the head having been considerably compressed, we shall usually find a circumscribed tumour on the scalp, at the vertex, as depicted in Plate XXX. fig. 92, Plate XXXIII. fig. 99, Plate XXXV. fig. 104, and Plate XXXVI. fig. 110. Such a swelling has been often supposed to contain fluid, and I have known it proposed to be punctured, though I never saw the practice carried into effect. There is a feeling of subdued fiuctuation in the tumour; but it is not a morbid growth; it proceeds entire from the collapse of the bones, owing to the compression which they have suffered. Generally speaking, these cases do very well; there is no fluid present, or merely a small quantity in the cellular texture, that does not require to be let out by an operation. As the brain becomes more developed, or regains its healthy form, the bones in a few days acquire their natural position, the head its proper shape, and the tumour disappears. It is only necessary to apply an ovaporating lotion to the part,—more, perhaps, for the sake of satisfying the mother, than for any decided advantage likely to be derived from its use.

Order III.—OF PRETERNATURAL LABOUR.

Plates, XXXVIII., XXXIX., XL., XLI., XLII., XLIII., XLIV., XLV., XLVI., XLVII., XLVIII., XLIX., L.

Hitherto the attention has been confined to different cases of head presentation; but as there is scarcely any point of the fœtal body that may not present in labour, those cases in which any other part meets the finger than the head have been classed, after Denman, as *preternatural labours;* of these by far the most frequent is the presentation of one or both nates.*

* Many speculative fancies have been indulged in, designed to account for the preponderance of head presentations; and gravitation has had most supporters. It was supposed that the placenta was invariably situated at the fundus uteri; and that, the fœtus being suspended by the funis umbilicalis, its head, which is the heaviest part, naturally inclined downwards; especially as in the younger embryo the umbilicus is comparatively so near to the pubes. This, however, cannot produce the influence ascribed to it; because, during at least the latter half of utero-gestation, the fœtus is not suspended by the funis, which indeed is too long to admit of such a possibility;—because the placenta is not always, nor indeed generally, implanted at the fundus uteri,—being sometimes even situated upon the cervix, or over the mouth of the womb itself; in which case, at no period of pregnancy would the fœtus be suspended under the upright posture of the body;—and because the funis is sometimes found coiled around one of the fœtal limbs; which accidental position must influence the depending part, even if the embryo were actually suspended. These and other facts are most forcibly adduced by Dubois, in a paper published in the third volume of the Memoirs of the Royal Academy of Medicine, page 431, to overturn the opinion that gravitation had any influence in producing the presentation of the head; and he has ascribed the general situation to an instinctive impulse implanted in the fœtus, which inclines it to take the most favourable position for its escape,—as the needle points mysteriously to the pole. But such a mode of rea-

Two orders.—Preternatural labours are divided into two orders; the first embracing presentations of the breech, or any part of the lower extremities; and the second, those cases in which the child offers itself transversely.*

1st. PRESENTATION OF THE BREECH OR LOWER EXTREMITIES.

Breech Presentation.—A woman will frequently suspect that she is about to have a cross-birth, as it is called, (for all preternatural cases, in common *parlace*, are so termed,) if she have suffered some peculiar feelings under pregnancy, such as she has not previously experienced, or if she be different in her size and shape from what she had been on former occasions. But on such supposed indications we can place no reliance. Inasmuch indeed as the child lies with the long diameter of the ovum in a situation perpendicular to the trunk of the body, the general shape of the uterus will be much the same as if the head were downward; and

soning and illustration cannot be considered either as argumentative or conclusive; it is, in fact, completely evading the question, after attempting to elucidate it; and the method he has taken can only be regarded as a cloak for human ignorance. It would, in my opinion, be much better not to endeavour to explain the secrets of nature, so deeply hidden, but to content ourselves with referring this also to a general, though not invariable law,—a part of the great system which shows the design, and exemplifies the harmony, that reign throughout the whole works of Providence. M. Virey, (Revue Médicale, vol. ii. 1833, p. 397,) indeed, has stated that in those pregnant animals of the multiparient kind which he has dissected, he always found in the horns of the uterus the snouts pointing to the vulva; that in a gravid viper which he opened, all the young, eight in number, were placed in the direction with their mouths towards the external parts; that, in the egg, the head is always directed to the large end, and that that end is extruded first; and that the same obtains with regard to the ova of fishes. We all know that the larvæ of insects escape with their head first,—that the chrysalis eats through its shell, and the caterpillar through its silky covering; and we see, therefore, one common law regulating the whole of nature's operations.

* The average frequency of breech presentations has been variously stated, as different tables have been taken for the guide. The returns from the *Maternité* in Paris, published by Dubois, (Dictionaire de Médecine, second edition, vol. i. p. 370,) calculated from 20,517 deliveries, show one in 33—30 births. Collins (Practical Treatise on Midwifery, p. 40) gives the average of "preternatural presentations," during his mastership of seven years at the Dublin Lying-in Hospital, at one in thirty. The number of children born in this period was 16,654. The tables which I have kept of the patients of the Royal Maternity Charity in London, delivered under my own superintendence, since the year 1827 to this date, Sept. 1st. 1840, amounting to 27,739 cases, and 28,043 births, give an average, as nearly as possible, of one in thirty-five. All, these, however, include twins and premature labours, in which class of cases irregular presentations are more frequent than in single births or labours at full time.

there is not one symptom by which we are able to detect that the breech will present, previously to the commencement of labour. It might be supposed, perhaps, if the uterine parietes were unusually thin, and the woman much attenuated, that we should be able to feel the hard globular head towards the fundus; and that this might lead us to believe the breech would present in labour; but any suspicions drawn from such a source must be very liable to error; for it is far from easy to distinguish the head by the hand applied externally: and the labour must be somewhat advanced before we can ascertain that the breech is offering itself at the pelvic brim.

Causes.—Many accidental causes, which may be avoided, have been supposed to produce cross-births; such as violent exercise, the shaking of a carriage, different postures of the body, and especially that in which the hands are frequently raised above the head,—as in the case of females employed in shops. It is now, however, fully known that such circumstances influence in no degree the situation of the infant in the womb; for women who confine themselves closely to the sofa during the whole of gestation, are liable, equally with those who take active, or even violent exercise, to have their children present preternaturally. Some women, indeed, from original formation, or other at present inexplicable causes, appear particularly obnoxious to this mischance, and it has occurred to me to know many instances of such peculiarity.*

Irregular presentations are popularly believed to be more frequent among the lower than the higher classes. I have myself reason to think that this observation is not correct. In the aggregate, there certainly are more cases met with among the poor than among the rich; but not more than the relative numbers of the two orders would lead us to expect.

Particular position of the child.—Under a breech presentation, the child may be variously placed in utero; with the back towards the abdominal muscles of the mother, and the face towards the spine,—with the face anteriorly, and the back towards the spine,—with one ilium looking towards the promontory of the sacrum, the other towards the symphysis pubis, and the face to one or other side of the mother,—and, lastly, in a diagonal direction, one ilium being situated against the sacro-iliac symphysis, the other behind the groin of the opposite side. The first-named position is the most usual, with the back towards the abdominal muscles, the face towards the spine, with the right side towards the left side of the pelvis, and the left side towards the right, Plate XXXVIII. fig. 115, and the fœtal body is inclined, in a slight degree, towards a diagonal posi-

* See in confirmation Collins, Op. Cit, p. 40.

tion, one of the nates being a little in advance of the other; so that the child does not present itself with the anus directly over the centre of the os uteri but, a little to one side.

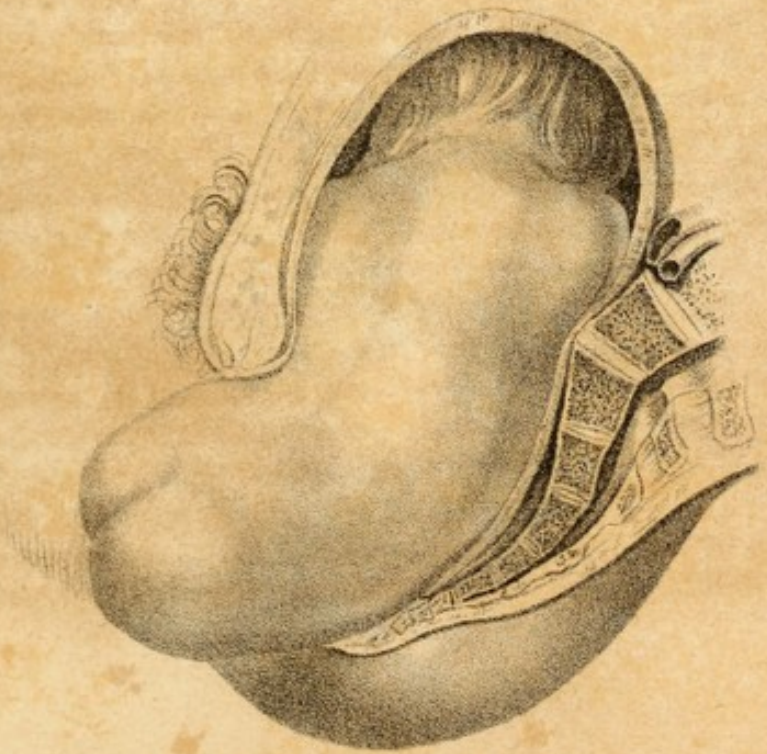
Progress of the labour.—When the breech presents, the labour commences exactly in a similar manner as though the head offered itself: previously to the accession of uterine pains, the womb subsides lower in the person,—partly in consequence of the cervix uteri being received into the cavity of the pelvis, and partly in consequence of the contraction going on in the uterine volume itself. The pains at first appear weak, slow, and at long intervals; but they gradually increase both in frequency and strength. Under these contractions the os uteri dilates, the membranes protrude through it into the vagina; after an uncertain time they rupture, and the breech of the child occupies the brim.

In illustration of the passage of the child through the pelvis, I will instance the case most commonly met with—viz. where the face is looking towards the spine, and one ischium is somewhat preceding the other. The os uteri being entirely dilated, the membranes broken, and the breech entering the pelvis, it is propelled downwards with each pain, and recedes a little in the interval, till it comes to press on the outlet of the pelvis. Now, inasmuch as the greatest width of the breech is from side to side, it is evident that the fœtus has already adapted itself to the capacity of the pelvic brim, in the situation most favourable for its entrance into the cavity; but when it presses on the outlet, its long diameter is opposed to the short diameter of the outlet; and in this situation a slight turn is effected;—though not so complete, perhaps, as the head takes under a natural presentation;—one of the ilia sweeping the cavity of the sacrum, and the other appearing under the arch of the pubes. In this way it is propelled, distending the perineum considerably, till the breech is entirely in the world. Plate XXXVIII. fig. 116. The legs pass doubled, with the toes up towards the chest, and, as soon as they are expelled as far as the knees, they are usually thrown out of the vagina by the action of its fibres. When the body of the fœtus is thus passing through the outlet of the pelvis, after the turn is effected, the shoulders are entering the brim, either with their long diameter in the direction of the lateral diameter of the brim, or a little diagonally. As the fœtal body traverses the cavity, the hands are slipped up towards the head, so that the axillæ and the inner surface of the arms come into direct contact with the mother's structures. The pains continuing, and the fœtus being propelled lower, the axillæ come to press against the interior surface of the ischia: another turn is then effected; by means of which, one peeps up under the arch of the pubes, and the other is directed along the sacral cavity and the perineum. Here, again, the shoulders are thrown into the best possible position for

Fig. 115.



Fig. 116.



Sinclair's Lith.

their escape, and, at the same time, the head is entering the brim in the most favourable situation for its transit; but on arriving at the outlet, the chin hitching on the internal surface of one ischium, the occiput on the other, the greatest diameter of the head is in the direction of the shortest diameter of the outlet; and it is as impossible that it can pass without being changed in situation, as it would be while the face looked to either ischium under an original presentation of the vertex. It is necessary, therefore, that a third turn should take place; and this, like the previous turns, is accomplished by the expulsive action of the uterus above, being resisted by the formation of the bones below. The face is thrown into the hollow of the sacrum, the occiput under the arch of the pubes, and the head is expelled with the face sweeping the perineum. Usually the arms remain by the side of the head until the child is quite born, if no assistance be rendered.

The case next in frequency is, where the face looks anteriorly, and the back towards the spine. The same effect is produced by the expulsive efforts as in the former. The breech descends to the outlet of the pelvis, receding and advancing alternately, as the pains return and intermit; a slight turn is effected; one of the ilia appears under the arch of the pubes, the other traverses the perineum; the breech and legs are born; the shoulders pass the brim, and descend until they press upon the structures at the outlet; one of the axillæ is then directed under the arch of the pubes, the other follows the curve of the sacrum, and the head is propelled into the cavity of the pelvis, with the face looking to one side and the occiput to the other. It might, *à priori*, be supposed that as the face was originally lying towards the abdominal muscles of the mother, the occiput would be expelled along the hollow of the sacrum, and the face escape anteriorly; but this is not the case; for when the shoulders are external and the head is in the pelvis, the face is directed to one side or the other, exactly as when the child presents with the face towards the spine in the first instance; and a precisely similar turn is effected, the face being thrown backwards; so that the fœtus, in its transit, makes a semi-circular rotation, the face being placed forwards at the commencement of labour, and being expelled through the outlet traversing the sacrum and perineum. I believe that in no instance, if the case were left entirely to nature—provided the child and pelvis were of common size and form—would the face be expelled under the arch of the pubes.

If the breech is offering itself diagonally, exactly the same occurrences take place which I have just described; for the pelvis is almost, if not quite, as wide from the sacro-iliac synchondrosis to the opposite groin, as from side to side. But when the child's abdomen is directed to one ilium, and the back towards the other, the long diameter of the breech is in the

direction of the short diameter of the pelvic brim, and the probability is, that it would not pass with the same ease as in the former case; but that it would be turned a little to one side before it entered the cavity. The changes in position just adverted to then take place, and expulsion is accomplished in the same way as if it offered in the more usual direction of breech presentations.

Breech presentations with feet.—It is, however, not only breech presentations that form the first order of preternatural labours: one or both feet may present, Plate XXXIX, fig. 117, or a foot and the breech together, or both feet and the breech, or a knee and a foot, Plate XXXIX, fig. 118, or both knees. Thus even this apparently simple order of preternatural cases admits of a great variety.

It is evident that there will not be more difficulty when the knees present, than in a breech presentation—probably not so much; because the parts are expanded more gradually, the body of the child forming more of a cone. But although it is, perhaps, not so painful a labour as when the legs are doubled up towards the abdomen, still it is more dangerous to the child, since there must be more pressure on the funis umbilicalis when the upper part of the body, or the head, is passing, in consequence of the parts not having been so completely opened as if the breech had previously escaped double.

If the breech and one or both feet should present, which is by no means unusual, more space would be occupied, and more time would be generally taken up, than when the breech presented singly; but still the same action would go on, and the same effect be produced, provided the pelvis were sufficiently large. One foot, or perhaps both, would be protruded externally before the breech, the same turns would be effected, and the labour would most likely be completed by nature, without much assistance.

Conduct under breech presentation.—In cases of breech presentation a great deal more attention is required of the obstetrician than under a natural labour, as well for the protection of the woman's parts, as for the preservation of the child's life; for the infant is always placed in greater or less jeopardy from the pressure which must take place on the funis umbilicalis during the passage of the shoulders and the head. More care is requisite to prevent injury to the woman's structures; because, in natural labour, when the head is born,—since that possesses the largest circumference of any portion of the fœtal body,—the passages are generally sufficiently distended by it to permit the easy transit of the other parts. But when the breech comes first, being smaller in diameter than the shoulders, it only causes a partial dilatation; the shoulders pressing upon the parts subsequently, distend them still more, and at last the head, which

Fig. 117.

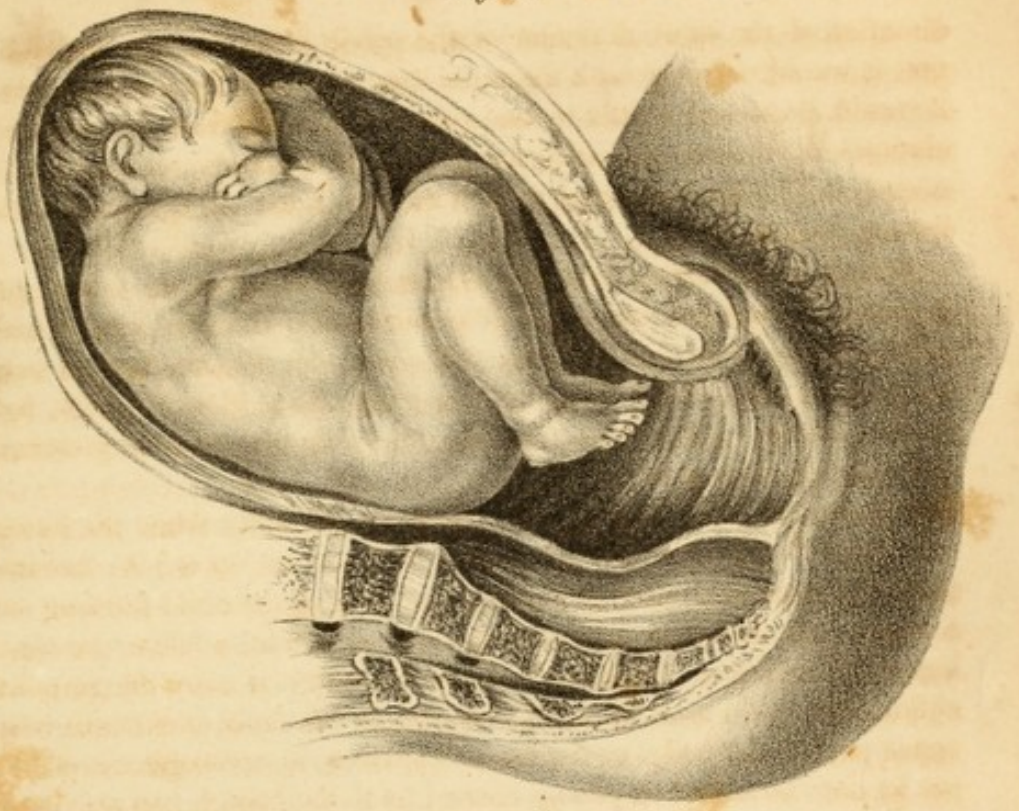


Fig. 118.



Sinclair's Lith.

is the largest body, has still farther to open them; so that we must continue our support to the perineum until the infant is entirely in the world. In natural labour, however, it is only necessary to protect these structures while the head and shoulders are making their escape.

The first duty we have to perform, is to ascertain the presentation; and it is a matter of the greatest possible consequence that we should detect a breech case early in labour, lest we should confound it with the head, and more particularly with the shoulder; for there are many points of resemblance between the breech and both these parts; and,—while a breech case requires comparatively little assistance,—under a shoulder presentation, the performance of an operation both difficult and dangerous becomes necessary to accomplish delivery.

No indication authorizing a supposition that the breech presents, can be gathered from the mode in which the membranes protrude into the vagina, which is usually,—as when the head offers,—in the form of the large end of an egg. But the breech may be discriminated from the head and other parts, as soon as it can be felt by some marks both positive and negative; and I shall now only point out the diagnostic marks with reference to the head, reserving those connected with the shoulder for future consideration. The breech is not so round, nor so hard, nor so strongly ossified, as the head:—it is not divided into compartments by sutures and fontanelles; on the contrary, it possesses two hemispheres; it is more fleshy, softer to the finger, and is not so resistant to that touch; we may most probably also detect the chink between the thighs, the organs of generation, and the anus. If we have fully ascertained the existence of these negative and positive marks, and especially if we have detected the organs of generation, male or female, and the anus, it is impossible that we can mistake the breech for the head.

These points must be determined previously to the rupture of the membranes; and our examination must be made with the greatest care, and in the interval of uterine contraction, lest we should break the membranes; for it is even of greater importance, in the case we are considering, that we should preserve the watery cyst entire, than if it were a head presentation. When we first make an examination, if the nates be the most depending part, and we ascertain that there is not that characteristic feel which the head supplies, we may be in doubt as to whether the shoulder or breech be at the brim. If so, we should pass two fingers of the left hand, during the absence of pain, into the pelvis, up to the brim, within the os uteri; and it is seldom that we cannot, in this way, gain the information we require. Having, then positively detected the breech, there is no necessity for alarm,—we are not to suppose that the woman will be endangered;—we must not manifest, in our manner, either agitation or

anxiety;—and we must be particularly cautious not to let the patient hear "a cross-birth" whispered in her chamber, because she will certainly be more or less excited; and such a shock might be suddenly impressed as to suspend labour, and retard it for a number of hours. We may, then, endeavour to evade her anxious question, *whether every thing is right*, by assuring her of her perfect safety. At the same time, it is desirable that her friends should be informed that the case is one of the simplest kind of *cross-births;* that most probably no operation will be required, but that there is a great chance—especially if it be a first labour—that the child will not be born alive. If in this first examination we are quite satisfied that the breech presents, but not able to detect whether the abdomen of the child is situated backwards or forwards, it is neither necessary nor proper that we should be constantly making examinations for the purpose of ascertaining this point. It is right that we should be a little more assiduous in our attention to the patient than if the head presents, but not so officious as to alarm her; and it is quite requisite that we should not absent ourselves from the house. We may occasionally institute an examination in the absence of pain, to watch the progress of the dilatation of the os uteri, and the descent of the membranes, but we must be most careful not to break them, although they should appear externally; waiting even then, within proper limits, for their spontaneous rupture.

The membranes having broken, and the breech fully occupying the pelvic cavity, we must apply our hand, guarded by a napkin,—in the same way as when the head presents,—over the perineum, and support it until the breech and legs are in the world; and as soon as the funis has appeared externally, we must bring down a fold, Plate XL. fig. 119, in order to present its vessels from being stretched. It has been shown that the umbilical arteries run in a twisted direction around the vein, and it is a necessary consequence that a compression of their cavities, and a diminution in their calibre, would take place quite as easily from a tightening of the cord, as from actual pressure being applied to it. We cannot prevent the direct compression which the funis must suffer between the child's head and the pelvic bones, but we can prevent tension, by bringing down a portion as a loop; and it is very possible, if we neglected this precaution, that, as the body was being expelled, the cord would be so stretched as to impede the circulation, and destroy the infant's life.

When the shoulders are about to pass, it is our duty to take care that they are offering themselves in that position most favourable for their exit, and if they be not, to turn one under the arch of the pubes, and the other into the hollow of the sacrum; and this is doubly requisite, not only for the easy transit of the arms themselves, but for the purpose of placing the

Fig. 119.



Fig. 120.



Sinclair's lith

head in the most favourable position for its passage through the brim. The arms being brought down, we may direct the head into the most easy situation for its escape, taking advantage of the expulsive action of the uterus to aid our gentle endeavours. When the head is fully occupying the pelvis, the chin being within one ilium, and the occiput within the other, we may with great advantage facilitate the turn of the face into the hollow of the sacrum, by placing the right hand on the back of the child, the left on the abdomen; the first two fingers of the right hand forming a crutch around the neck. We may then support the perineum with the left hand; as the head is passing, we may turn the nape of the neck up under the symphysis pubis, as on a pivot; bring the back towards the mons veneris; and thus assist the birth, not by drawing the child's head forcibly out, but merely receiving it as it is expelled by the action of the uterine and vaginal fibres.*

The child being born, our duties are merely those appertaining to common labour; we must wipe its face, take care that it does not inhale any of the mucus about the parts, separate it as before described, dispose of it to the nurse or some other party, and then make an examination of the uterine tumour. In all cases of breech presentation, it is right that a warm bath and other resuscitating means should be in readiness, and close at hand, in order that the best chance should be afforded of restoring the child, provided animation be suspended.

It used to be the custom, and it is still practised by some, to make traction, as soon as the breech is in the pelvis, and before the nates appear externally, by hooking the finger first in one groin, and then in the other, and to bring down the legs, so that the feet might pass externally as early as possible. Dr. William Hunter at one time recommended this practice, and he was by no means a meddlesome obstetrician. The object of the recommendation was to save the patient pain. It was argued, why should we suffer the woman's structures to be so much distended by the double

* I have been called upon to extract the head in many cases, where it was supposed that the pelvis was distorted or the head preternaturally large, merely because the previous attendant had not been mindful of causing the head to pass through the brim with its long diameter in the direction of the long diameter of the brim, but had brought the child down with the face backwards, so that the forehead impinged on the prominence of the sacrum, as shown in Plate XL. fig. 120, or forwards against the symphysis pubis; such an accident, besides entailing much additional pain on the mother, is almost certainly followed by the infant's death, from the pressure to which the cord must be exposed. It may be prevented by paying due regard that the face passes through the brim towards one or other ilium, and may be remedied, when it has taken place, by turning it in the same direction. Placing the head in the most favourable position for its passage through the brim, is one of the most important points in the management of a breech case, but it is of all the duties appertaining to such a case, perhaps, the one most frequently neglected.

breech, when we have it in our power easily to relieve them of the tension, by bringing down the feet, and allowing them to be expanded more gradually; and it certainly was both a very plausible argument, as well as natural conclusion. But the result of this practice is to place the child's life in imminent hazard: as long as the legs are turned up towards the belly, so long that portion of the funis near the child's body may possibly be protected by the triangular space formed between the two thighs and the abdomen; and thus a certain degree of security may be obtained.—Again, when the breech has been expelled doubled, it has prepared the way for the exit of the shoulders and head much more completely than when it has passed with the feet foremost. The woman's structures must be subjected to a definite degree of distention during the passage of the head; and the extent to which that distention is carried is not influenced at all by the mode in which the breech has passed the pelvic apertures. Is it not better, then, that she should suffer the pain which cannot be prevented, at first, with the chance of saving the child's life, than undergo it afterwards, when there is a much greater probability of its being born dead? Dr. Hunter, indeed, soon saw the danger of interfering in the manner he first adopted; and he was accustomed to say in his lectures, that when he used to extract the legs before the breech, he lost almost every child; but when he changed his mode of practice, and let the breech pass double, and did not allow the legs to escape until after the knees were born, he was much more fortunate in saving the children;* and the same facts have been established by subsequent observers. When the body is expelled, indeed, and the arms still remain within the pelvis, our active assistance becomes not only useful, but almost necessary: we may then endeavour to relieve the parts from distention, by bringing the arms cautiously down, for their presence in the vagina can be of no service; they cannot preserve the funis umbilicalis from pressure;—nay, they are actually doing harm, for they take up room, prevent the easy descent of the head, and may perhaps themselves press upon the cord. But in attempting to bring down the arms, our efforts must be most gentle; and we must be very careful to direct the limbs forward, so that the hands should sweep over the child's face. If we were to turn them backwards, we must necessarily break or dislocate the humerus—an accident that might most easily happen, from the imperfectly ossified state of the bones. That arm placed behind the symphysis pubis must be brought down first; and this is generally not difficult to be accomplished, by sliding one or two fingers perfectly over the shoulder, carrying them a little way along the humerus, and carefully directing the fore-arm anteriorly; this being ef-

* See Merriman's Synopsis, p. 71; note of Dr. Hunter's MS. Lectures.

Fig. 121

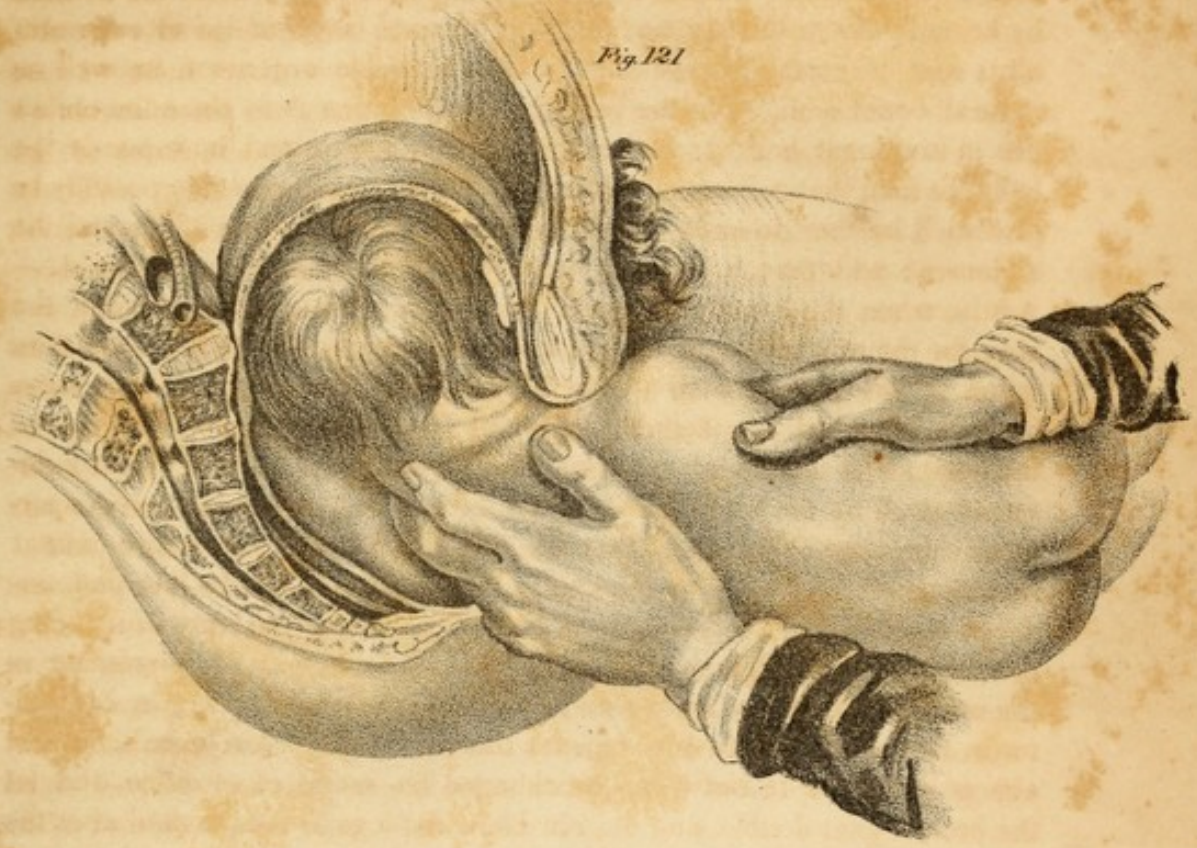


Fig. 122.

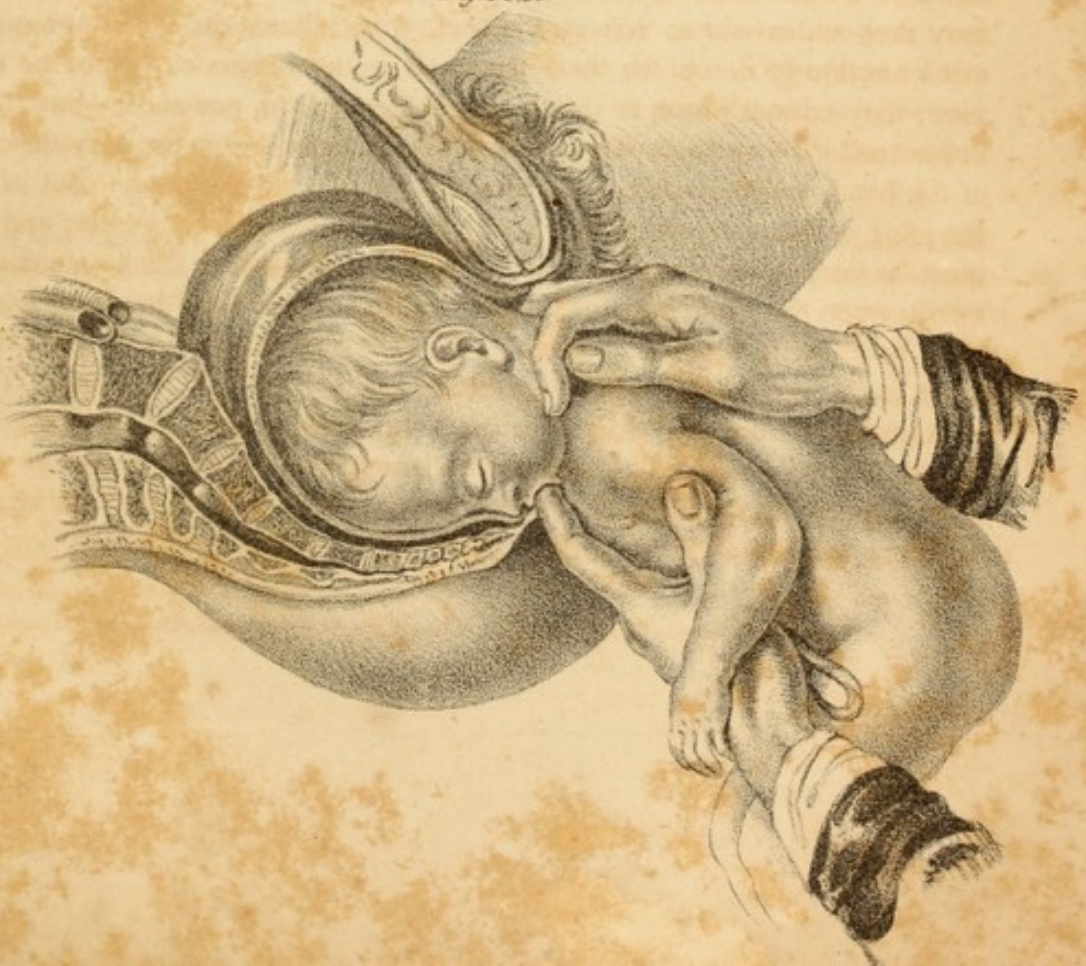
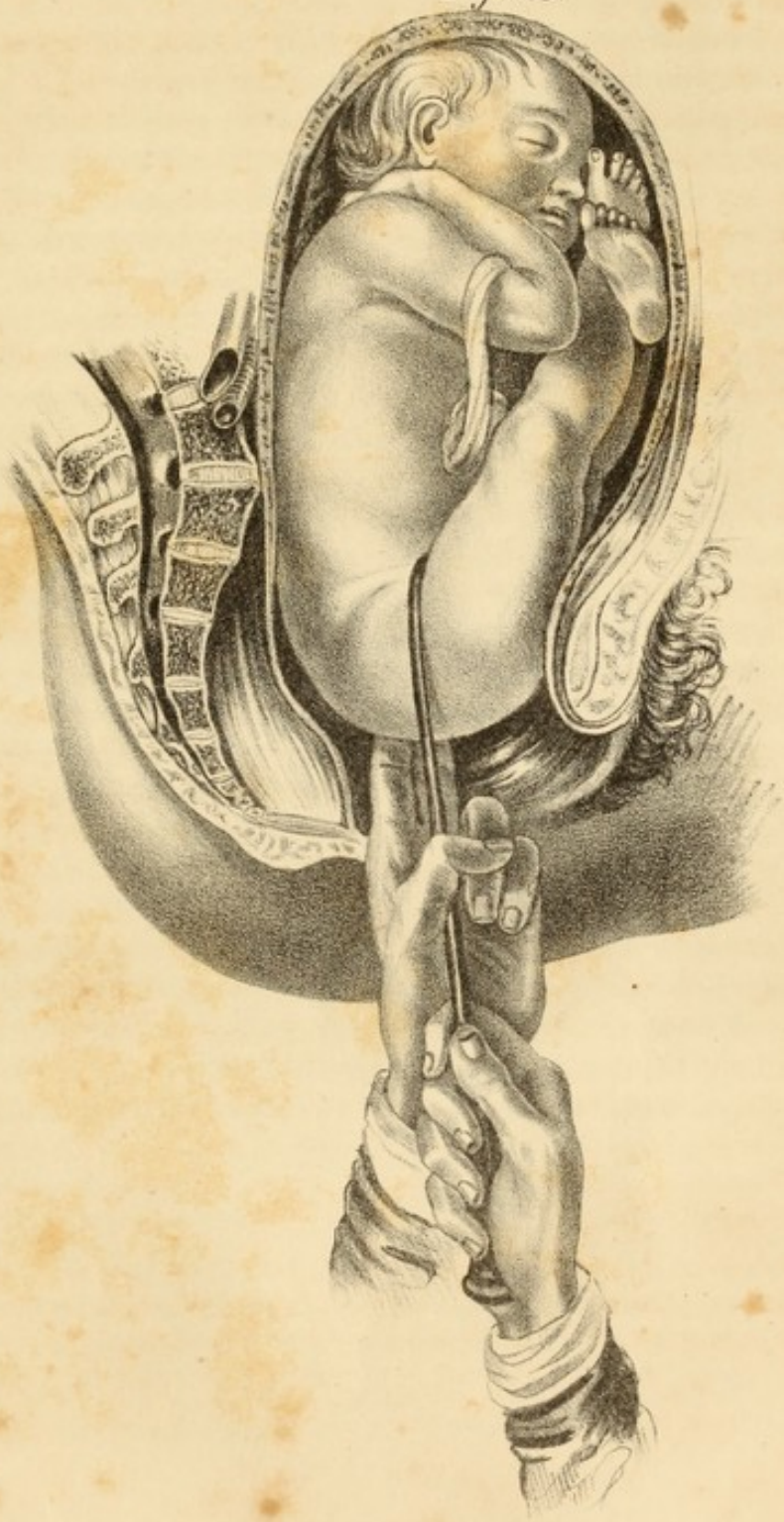


Fig. 123.



Sinclair's Lith.

fected, we may bring the child's body forward, so that the side of the neck should be applied closely under the symphysis pubis, introduce two fingers of the left hand back towards the sacrum, and in the same tender manner extract the other arm. Plate XLI. fig. 121.*

The parts being now relieved from tension, the head pressing somewhat on the outlet of the pelvis, we way favour the inclination of the face into the hollow of the sacrum by the means just recommended; and if there be any difficulty in so doing, we may pass a finger into the mouth of the child, Plate XLI. fig. 122, depress the chin, and give the head the requisite turn. Let us not, however, forget the delicate structures on which we are operating: let us remember that the bones are not strong and solid, but are easily broken; that there is a symphysis in the centre of the jaw; that we may either dislocate the articulation, separate the symphysis, or break the bone itself. Every practitioner is aware how tenderly conducted should be the examination of an infant's body after birth; and quite as gentle should be our attempts to relieve it during labour.

Under a breech presentation, after the liquor amnii has been avacuated, the meconium is frequently, but by no means invariably, squeezed out of the rectum, by the mechanical pressure sustained. This circumstance has therefore been noted as a symptom of breech presentation. It is dangerous to rely on this occurrence for an indication; both because it is not universal in breech presentations, and also because it may take place under other positions of the fœtus. Besides, it cannot appear until after the rupture of the membranous cyst; and it is far better and safer to trust to the knowledge gained by a minute examination of all those points of the fœtal body which can be embraced by the finger, than to any accidental sign.

Knee Presentations next come under consideration. I will suppose that the child is at the brim of the pelvis; that the labour in the first instance is going on pretty well—much the same as if the head or breech presented. The os uteri opens, the membranous bag somewhat protudes—perhaps in the form of the finger of a glove, instead of assuming the cha-

* Denman, chap. xiv. sect. 3, says—"It has been esteemed by some a very injudicious practice to bring down the arms of the child; these being turned along the head, preventing in their opinion, that contraction of the os uteri round the neck of the child, which would be an impediment to its complete deliverance." Such fears are merely hypothetical.—I never knew the occurrence dreaded take place so as to retard the child's passage. When the undilated state of the uterine mouth offers much impediment to the birth after the body is born, it is by girding the *upper* part of the head just above the nasal bones, as is well described by Merriman, Synopsis, p. 76.

racter of an egg; but this is not always the case. Upon making our examination at the commencement of labour, we detect a small round substance, with a flattened surface, possessing the characteristics neither of the head nor the breech. We are then quite sure neither of these parts present; but we may not be so certain whether it be a leg or an arm that meets our finger.

Plate XXXIX. fig. 118, shows a knee and foot presenting, and a fold of the funis prolapsed.

If one or both knees offer, the case will usually be terminated by the natural efforts; but if it be an elbow presentation, under which the child lies transversely, we must change its position before delivery can be effected. It, therefore, becomes a matter of the greatest consequence, that we should discriminate between the patella and olecranon; and I shall mention the distinctive marks, when on the subject of transverse presentations.

The knees will descend into the pelvis; and the legs will drop out of the vagina, earlier than if the thighs had been bent up towards the abdomen; the breech of the child will be expelled; the funis umbilicalis will have lost its protection; and the infant will be in great danger of strangulation.

Footling Presentation.—Again, one or both feet may present, the breech being easily distinguishable by the finger, or lying perfectly out of the reach of a common examination. Plate XXXIX. fig. 117.

When we feel the digital extremity of the limb,—since there is no part of the child's body but the hand with which it can possibly be confounded,—it becomes our duty to discriminate between the two, for reasons previously more than once inculcated; and this we can generally do before the membranes rupture. The foot is known by the rounded instep, by the prominent heel, by the toes being all in one line, and by no one of the digits being an opponent to the others. When the hand is at the pelvic brim,—as I shall hereafter state,—we feel the flattened wrist and palm, the thumb an opponent to the fingers, the fingers of different lengths, and the absence of the marks just described.

Under presentation of the feet, the labour is usually rather lingering, and the dilatation of the passages goes on but slowly; nevertheless, this forms no excuse for hurry or interference: we must wait a moderate time for the descent of the child, and allow nature to accomplish her intention unaided; unless, indeed, there be danger, or some urgent reason for accelerating the labour. Should delay induce us to interfere, or should symptoms of danger supervene we must take one foot, or both, between two fingers of the left hand, and, by a little traction, bring down the legs; and then we have made the case one of the most simple preternatural labours.

Circumstances requiring assistance under a breech presentation.—Many accidents may happen during the progress of labour under a breech presentation, independently of exhaustion from a long continuance of painful efforts, which will require that delivery should be accelerated; and some of these originate in the mother's system, others in the child's. Thus hæmorrhage, convulsions, or syncope, may induce us to terminate the labour; and delivery is generally more easily accomplished than when the head presents; for we are then compelled either to introduce the hand into the uterus, and change the position of the fœtus, or to apply the forceps, or use the perforator, if that dreadful instrument be required to save the mother; but when the breech or feet present, we have merely to make extraction by the leg, provided it be easily brought down, or by surrounding the groin with a finger or blunt hook,—as will be more particularly described subsequently.

Danger to the child's life would also induce us to expedite the termination of the labour.

We are not likely to ascertain that the child is in jeopardy until after the breech is expelled; but, when the body is half born, our indication may be taken partly from the state of pulsation in the cord, and partly from a futile attempt at respiration being made while the head still remains either in the uterus or vagina. I have already directed that as soon as the umbilicus has appeared externally, a loop of the funis should be brought down, to prevent tension on its vessels; and, at the same time, an observation may be made on the rapidity and strength of the fœtal circulation. If the arteries of the funis are beating freely, firmly, and equably, about one hundred strokes in a minute, the child is in no present danger, and we need not accelerate the labour for its sake; for by so acting we might leave the uterus uncontracted, and occasion an attack of hæmorrhage. But if, on the contrary, the circulation be languid; or if the beats be very rapid, small, feeble, tremulous, or intermittent, some impediment exists to the transmission of the blood through the cord, and the child's life is in imminent hazard.

The other indication implying danger to the child, is an abortive attempt at breathing before the head is in the world; and this is known by a sudden spasm of the diaphragm and abdominal muscles, repeated at uncertain intervals. It would appear almost incredible that the infant should endeavour to respire while the face is closely embraced by the maternal structures, and when it can inhale nothing but the uterine discharges: such, however, I have witnessed on numerous occasions. This convulsive effort is never observed so long as the circulation along the funis is carried on with vigour; because, while the child's wants can be supplied through the medium of the placenta, there is no necessity for

calling forth the hitherto dormant function of the lungs; but when that source is cut off, a fresh action is requisite for the continuance of life. This gasp, then, is indicative of danger, and, together with a declining state in the power of the circulation through the umbilical vessels, would induce us to expedite the delivery, lest the fœtus should perish *in transitu*. In using our extractive means, however, we must ever remember the sensibility of the mother's organs, and the delicacy of the fœtal body. Violence may do irreparable injury; and great exertion even, in the case under consideration, is inadmissible.

Difficult breech presentations.—Having become acquainted with the mechanism of head and breech presentations, and the difficulties that are sometimes met with under natural labour, the student may readily suppose that delays will also occur, and that impediments will exist to the easy passage of the fœtus, when the nates, or any part of the lower extremities, offer themselves at the pelvic brim.

All the causes referable to the mother, which have been before described as producing delay under natural labour, may equally occasion difficulty when the breech presents; and these may all be included in one of the two general heads—either inefficiency of the propelling powers, or a diminution of space in the passages.

Inefficient uterine action.—It is not unfrequently remarked, that under breech presentations, after the rupture of the membranes, the uterus for some time acts more feebly than in natural labour; and this is perhaps owing to the breech producing less pressure or irritation upon the os uteri than the harder head would do: but the contractions presently become sufficiently strong; and when the pelvic cavity is pretty well occupied by the fœtal body, and the perineum somewhat on the stretch, the pains are fully as powerful as when the head is passing. Such cases, then, require no artificial assistance; nor is it necessary or desirable to stimulate the uterus to increased action. But should the patient have been debilitated by previous disease, worn down by excessive discharges, be of relaxed fibre, or have borne a great many children, we may anticipate a necessity for some extraordinary aid. Should, then, this sluggishness on the part of the propelling powers continue, while at the same time the pelvis possesses sufficient capacity, and the soft structures have acquired a due degree of relaxation and distensibility, it is right that we should endeavour, by the means already mentioned, (p. 165 et seq.) to increase the tone of the uterus, and supersede the necessity for manual interference ;—such are, warm diluents, taken internally; gentle friction, with slight pressure, over the abdomen; change of posture; and should the arterial system also be acting with diminished energy—we may have recourse to stimuli. The ergot

of rye, as a general rule, is perhaps inadmissible; but if it be exhibited, the cautions before noted must not be lost sight of.

Presuming, then, the case under treatment is one in which such circumstances obtain as I have just specified, and the means recommended have not the desired effect, it next becomes a question whether we are warranted in resorting to delivery by art. To answer this question, many circumstances must be taken into consideration, which have been before sufficiently dwelt on; but since artificial delivery under a breech presentation is for the most part easier than when the head offers, it may be allowable, and perhaps advisable, to use the means we are in possession of rather earlier than if the presentation were natural; provided, indeed, no risk would be incurred of injuring the maternal structures. The method to be adopted will depend much on the situation of the breech: if it be somewhat low in the pelvis, our finger will in most instances be sufficient for our purpose; by hooking it over the groin, and the application of a little traction, we may probably bring the breech to press upon the perineum; we shall then most likely find that uterine action is increased in proportion as the perineum becomes distended; and that no farther extractive aid is required. But should the breech be so high that we are unable to insinuate our finger round the thigh, so as to give us the requisite command, we may, by another very simple means, produce a most valuable and useful purchase: the extremity of a silk or cambric handkerchief may be worked over the groin, without any great difficulty: by drawing down the end of which, a loop is formed round the fœtal limb, and a most powerful hold is obtained. If the handkerchief be used carefully and tenderly, it is preferable to an iron hook; but should the application of the handkerchief be difficult or impracticable, we possess an instrument,—more efficient, perhaps, but more dangerous,—in the blunt hook,—to be employed only as a last resource. If the breech have entered in any degree into the cavity of the pelvis, we can generally succeed in encompassing one or other limb by a small-sized hook. Having, then, warmed and greased the instrument, we carry its handle up towards the abdomen, introduce its point within the vagina, and insinuate it over the bend of one thigh, directing it by the first finger of the left hand, previously passed round the groin; gentle traction must then be made in the direction towards the coccyx, and we shall most probably find the fœtal body descend. Plate XLII. fig. 123, shows the blunt hook, applied over the thigh, the first finger of the left hand guarding its point. In making use of the purchase we thus obtain, we must not lose sight of the delicacy of the child's structures, and the imperfectly ossified state of the bones; and we must bear vividly in our mind the remembrance of the grievous injuries we may, without caution inflict upon its person.

In the cases now under consideration, as well as those of impaction of the breech, we have been recommended by some practitioners* to adapt the forceps over each ilium of the child—if the os uteri be dilated—and to extract by a movement similar to that used when they are applied upon the head;† there are, however, numerous objections to this mode of proceeding. The instrument not being made for the breech, but for a more globular body, does not fit that part, and is liable to slip, to the great hazard of the mother's structures. The only way, indeed, by which we can cause the blades to keep their hold at all, is by squeezing the handles firmly together, so that the points may take a deep nip upon the fœtal body; and the youngest student in anatomy would at once call to memory important organs likely to suffer severely from this rude pressure. The fœtal pelvis might be broken; and that would be an accident of no trifling importance. We may also do irreparable injury to some of the soft parts. The liver, from its large size in the fœtus, occupying, as it does, the chief part of the abdomen, with its edge descending nearly to the pelvic brim, is much exposed to be bruised or ruptured; and this injury is the more likely to happen in consequence of its high vascularity, and the tenderness of its substance: nor are the intestines altogether secure from the chance of being wounded. For such reasons, then, I consider the forceps inapplicable to cases of breech presentation; and, if assistance be required, would infinitely prefer either of the three methods above recommended.

Distortion of the pelvis.—Supposing, however, that the protraction is caused by a want of room in the bony pelvis, and that the diminution of space is at the brim, in the conjugate diameter,—where, indeed, we usually observe it to exist,—it is evident that such a case must be difficult in proportion as the pelvis is contracted; and we shall sometimes, as in head presentations, find that difficulty almost insurmountable.

Our first duty, under such a state of things, is to detect the cause of delay; and we can have little difficulty in determining this point, for the uterus would most likely be acting sufficiently strongly to propel the breech through the brim, if there were space enough to admit it; and we can positively measure the dimensions of the pelvis as easily as though the head presented, and by the same means. The only question is as to the space necessary for the transmission of the breech. Now this part of the fœtal body does not possess a circumference so large as the head, and, being softer, it is more compressible; so that it may be squeezed through a smaller aperture than the cranium, while whole, would require: at the

* Hamilton, Practical Observations, 1840, p. 298.

† We read in Baudelocque (parag. 1251, translation) that this mode of delivery was first accomplished by a practitioner who mistook the breech for the head, adapted the forceps, and afterwards boasted of his novel success.

same time, however, since it possesses no cavity which can be opened, and no contents which can be evacuated, it is impossible to draw it through so small a pelvis as the mutilated and collapsed skull. If, indeed, the pelvis measure but two inches and a half from pubes to sacrum, I am persuaded the double breech may, by management, be made to pass, and that it could be extracted through a considerably less space, provided the legs were first brought down.

But, even if we succeed with the breech, a larger space is required for the shoulders; and if they pass, still there is more room necessary for the passage of the head, so that we have difficulty following difficulty, and each of them greater than the one preceding. This, indeed, is just the reverse of what happens under a head presentation; for, generally speaking, when the head is born, the body can be extracted with comparative ease.

Being, then, fully satisfied that the breech presents; having learned that the pelvis is malformed or small, the woman having been some hours in strong labour; perceiving that there is a chance of her sinking under her continued struggles, unless she be assisted,—we are fully warranted in offering relief by the means I have already stated. It is not, indeed, necessary to wait until the os uteri is entirely dilated, because the breech may be extracted through the pelvic brim before full dilatation has taken place, provided the organ be soft and distensible. It is our duty, in all instances, to endeavour to extract the child without injury to its person; but should the diminution of space be great, we can scarcely expect that it will pass alive; because if it be at the full time, and well ossified, we shall most likely be obliged to evacuate its brain before the head can be born. Notwithstanding this probability, since in the particular case under treatment it may be smaller or less ossified than usual, we must be most careful to prevent injuring its limbs, by the efforts we make for its liberation.

A gentle swaying motion from side to side will facilitate the escape of the body, after the passage of the breech, which being born, one shoulder must be turned into the hollow of the sacrum, and the other brought underneath the pubes. The arms must be extracted in the manner already pointed out, and the head must be brought to the pelvic brim, in the situation most favourable for its exit; namely, with the face to one ilium, and the occiput to the other; or with the face looking towards one sacro-iliac symphysis, and the occiput behind the opposite groin. We must then pass the finger of one hand into the mouth, and depress the chin, while we make traction by the first two fingers of the other, fitted like a crutch across the shoulders; taking care not to dislocate the neck or injure the jaw. By this means we shall probably enable the head to pass the brim; and when it has entered the pelvic cavity, we may turn the face into the

hollow of the sacrum, and we shall mostly have it in our power to complete the delivery with little difficulty, since the principal impediment will have been already overcome. (Plate XLI. fig. 122.)

Wherever there exists a diminution of space at the superior aperture of the pelvis, it is even more necessary to be careful that the face is turned to the iliac fossa while the head is passing the brim, that when the organ is of normal size; for reasons not necessary to be insisted on.

If, then, we have placed the head in this most favourable situation, and made use of as much exertion as we think ourselves warranted in doing, for the space of twenty or thirty minutes, without the expected success, we shall be compelled to diminish its bulk for the purpose of accomplishing extraction; and the operation is not much more difficult than if the head had originally presented.

The same deadly instruments are required for perfecting this intention. The cranium must be perforated, and the brain partially evacuated; but we do not feel so much compunction in having recourse to this measure as we should do in most cases where the head presents, because the child must be dead before the operation can be required. No person would think of perforating the skull before some considerable efforts had been made to extract it entire; and under those efforts the chance—amounting almost to a certainty—is, that the pressure on the funis would have been such as to destroy the fœtal life. On some occasions I have witnessed the gradual death of the infant from this cause, while I was unable to prevent it, or advance succour; and in others I have delayed applying the destructive means until the vital spark had flown; shrinking from being myself the instrument of death, but choosing rather—however sad the alternative—to wait quietly until I was assured the heart's last pulse had throbbed.

Mode of performing the operation.—The woman lying on her left side, an assistant must, by drawing down the body, bring the child's head down as low as possible, and turn the neck upwards, under the symphysis pubis, so that one acromion is towards the *mons veneris,* and the other towards the *fourchette.* An unoccupied space at the back part of the pelvis is thus procured, into which we can insinuate two or three fingers, of the left hand with ease; they must be carried up against the skull, to the projection behind that ear which is next the sacrum. Along these two fingers a perforator must be passed; and, making steady pressure against the part, with a semi-rotatory motion we introduce its point within the skull as far as the rests; the two handles of the instrument must then be separated by an assistant, the rests being protected by our own fingers, in the way that I recommended before, Plate XXXVI. fig. 110, and a crucial incision made, if practicable. Having made an aperture suffi-

ciently large to admit the perforator fully within the cranium, we break down the brain as perfectly as possible, and commence extraction. We seldom require to use an extracting instrument, since the means of traction is afforded by the body of the fœtus itself; but if it should be requisite, we can fix the crotchet on the inner surface of the bone, and a very firm purchase is obtained, because of the strength of the cranium at this part. It may possibly slip, or break away from its hold, when another point of resistance must be sought for; and while making these efforts we must be most assiduous in guarding the extremity of the instrument by our finger, to prevent laceration of the os uteri or vagina. If possible, an extracting instrument should be avoided; but if any be required, the crotchet or blunt hook appear to me much the most applicable.

There is certainly more difficulty in perforating the skull behind the ear, than when the vertex presents; and that for three reasons. In the *first* place, the vagina being partly occupied by the neck, our movements are rather impeded. *Secondly*, the bones, at the base of the skull are thicker, and consequently we must use more exertion in perforating them. And, *thirdly*, the point of the instrument is more liable to slip to one side—to run up between the bone and the scalp, and not to enter the skull at all. Such an occurrence is easily known by the very slight resistance offered to the passage of the instrument up to the rests; and also by examining the laceration we have made by the finger, after its withdrawal. If we find no jagged edge of bone, it is merely the scalp that is punctured, and we must make another attempt, by turning the extremity of the instrument a little more in the direction of the centre of the cavity of the skull. Sometimes, indeed, the perforator will slip in the same manner between the skull and the scalp, when applied to the vertex under a head presentation, and may produce some embarrassment; but this mischance is not so likely to occur when the head presents, as in the case now under consideration, because we have then a better opportunity of directing the point against the spot most dependent, and because the bones at the upper part of the cranium, not being so resistant, yield more readily.

If Plate VII. figs. 23, 24, and Plate VIII. fig. 26, be consulted, they will immediately show that it would be impossible for the breech to pass through them, even when diminished to the utmost extent it is capable of, —by the legs having been first extracted,—and compressed into as small a space as the semi-ossified structures will allow. Under such an aggravated state of disproportion, one alternative alone is offered us,—that of performing the Cæsarean section; and it becomes of importance to determine the size of the pelvis under which we are warranted in having recourse to this terrible expedient. It appears to me that somewhat more

room would be required for the transmission of the body and shoulders, under a breech presentation, than when the head rests above the brim; and, provided the conjugate diameter measured less than one inch and three quarters, I should think myself justified in proposing the abdominal incision. It certainly never occurred to myself to meet with a case in which the breech would not pass by the use of the means before recommended: such instances, however, are far from impossible. Even should we succeed, after much exertion, in extracting the body and shoulders of the child through a pelvis less than the dimensions I have just noticed, still I apprehend that the head, in this position, would require considerably more space, after perforation was effected, than when the vertex presented; and on this account also I should be inclined not to attempt delivery *per vias naturales*, unless there existed a clear space of one inch and three quarters,—at least if there were indications of the child being alive.

Pelvic tumours.—Other causes than distortion of the pelvic bones may occasion a want of the necessary space for the passage of the breech: thus, tumours may have formed in the cavity, such as I have before mentioned—exostosis, diseased ovaries, scirrhous and suppurating glands, polypi, and some others; and there are no specific rules which we can apply to breech presentations, under these deviations and difficulties, that are not applicable also to cases in which the head presents. Our indications are exactly the same: we save the child if we can, but not at the expense either of the mother's life, or of extensive, and perhaps eventually fatal, injuries to her person.

If the tumour possess distinct fluctuation, whether it be a suppurating gland or enlarged ovary, it should be punctured. If there be a polypus in the pelvis, impeding the passage of the child's breech, trunk, or head, it should be removed, provided that can be done without much danger to the mother; but if the tumour be hard and immoveable, so that we cannot lessen its bulk, and fear to dissect it away from its attachments, we must act upon the common principles, wait for some time, in the hope that nature may overcome the impediment, and if she fail, traction must be made with the finger or blunt hook surrounding the groin; or the Cæsarean section must be resorted to, according to the available space which the pelvis possesses.

Rigidity of the os uteri, vagina, and perineum, singly or combined, may occasion difficulty, as noticed under the head of lingering labour.

Under this complication, the os uteri may probably be relaxed by bleeding, by enemata, by the injection of warm oil or mucilaginous fluids into the vagina, and we may possibly deem it necessary to exhibit opium; the vagina and perineum may also be softened perhaps by artificial lubri-

cation and external fomentations. Failing in these means, delivery must be resorted to, by measures already sufficiently explained.

Head left in utero.—In the ages of rude surgery* it has not unfrequently occurred, that the head has been separated at the neck by violent and ill-directed efforts, and left in utero after the extraction of the rest of the body; but to meet with such a case is now rare. The only instance in which this accident came under my own treatment, happened in the practice of a midwife attached to a charity of which I have the charge. The child was putrid, and she had been attempting to extract it without reference to the propriety of its position. When I arrived, I found the chin hitched upon the sacral promontory, the vertebræ entirely separated, and the cranium attached to the body by a very small portion of integument which gave way completely on the least handling. There was a tumour in the pelvis, that possessed the characteristic of an enlarged ovary. Not desirous of encountering these difficulties alone, I requested my father's assistance, who promptly attended. Having introduced his hand into the uterus, he changed the position of the head, so that the crown came to the pelvic brim, and perforated it at the sagittal suture, while I steadied the uterine tumour externally. We had then little trouble in extraction; and this method appears to me the most likely to succeed of any which has been practised; but under such anomalous cases no rule can be laid down for universal, and scarcely for general guidance.

2d. TRANSVERSE PRESENTATIONS.

The second order of preternatural cases embraces all those in which any other part of the fœtal body presents, than the head, breech, or inferior extremities. When the fœtus lies transversely, the long diameter formed by its doubled body being across the uterus from side to side, the familiar term *cross-birth* is peculiarly applicable; and to this variety of preternatural cases it should, in strict propriety, be limited.

I have already stated it as my opinion, that there is no part of the child's body which may not offer itself as a presentation under labour. It will therefore necessarily follow, that when situated transversely, the head may

* See Ætius, tetrab. iv. sermo iv. cap. 22; also Paré, book 24, chap. 26. Experience has given me reason to believe that a head may be extracted entire, when the body is born, through a smaller pelvis than would admit of its passage under a vertex presentation, if the neck, is sufficiently strong to afford the means of moderate traction, and a finger can be satisfactorily introduced into the mouth.

lie upon the right or left ilium, with the face directed either forwards or backwards, so that either the right or left side, the back, chest, or abdomen, may be placed downwards.

It is of the greatest importance that we should be able to discriminate in practice between the first and second orders of preternatural presentations, because—as already shown—those which are embraced within the first are, generally speaking, terminated by the efforts of nature alone, or with very little artificial assistance; while, in those characterizing the second order, the very reverse obtains;—the child is so placed that Nature unaided can scarcely ever effect her object; and an operation always attended with pain, difficulty, and danger, is requisite before delivery can be accomplished. This operation, if undertaken during the first stage of labour, is comparatively easy; but, if delayed until the process is much advanced, it becomes one of the most difficult in surgery; and, *cæteris paribus*, the danger attendant upon it is in proportion to the difficulty. It would be superfluous, therefore, to insist on the necessity of early forming a correct diagnosis.*

There are no symptoms manifested previously to the commencement of labour, by which we are able to determine that the child lies transversely in utero. It has been said that if the uterus in its general figure, be broader than it is long, we may suspect a transverse presentation under labour: this, however, is by no means universally the case; is it but a vague supposition at the best, and no reliance can be placed on it: for the greater breadth of the uterus may depend on its containing twins; and although they both may be lying either with the head or breech downwards, it is evident that the organ must occupy more space laterally than if there were but one child lying in the natural position. An increased quantity of liquor amnii may also influence the shape of the gravid womb; and sometimes the uterine fibres are not developed with their accustomed regularity, but some, more rigid than the others, refuse to yield in due proportion, and thus occasion an unusual form. We can, therefore, by no means rely for a diagnostic mark on the external figure, as detected by the application of the hand.

Nor are there any causes evident to which we can assign this peculiar presentation of the fœtus. I have already mentioned that particular pos-

* As in breech presentations, so with regard to transverse cases the proportion to natural births has been variously estimated. In the *Maternité* at Paris, out of 10,742 children born between the first of June 1829, and the first of June 1833, there were fifty-nine by "the trunk," about one in every 182 cases. (Dubois, Mem. de l'Académie Royale, tom. iii. p. 450, 1833.) Collins (Op. Cit., p. 73) gives us an average of one in nearly 416; the calculation being taking from 16,654 births. In the Royal Maternity Charity in this city, out of 48,557 births, of which on this subject I have an accurate register, the proportion of transverse cases is one in nearly every 326 cases, including twins and premature children.

tures of the mother's body were supposed to regulate in some degree the position of the child in utero: but this observation is proved to be as incorrect in regard to shoulder presentations as it is to breech.*

Transverse presentations are by no means comparatively more frequent among the poor than those in affluent circumstances: but some women seem to be naturally predisposed to this irregularity. Thus a patient, whom I attended in all her labours, out of five children which she has borne, has been the subject of four transverse presentations: her pelvis is slightly distorted at the brim. And another woman, now dead, who always, under pregnancy, became a patient of the Royal Maternity Charity, in twelve labours suffered seven shoulder presentations. I delivered her myself five times under these difficulties, and my father twice. This person also possessed a contracted pelvis.

Suspicious symptoms.—It is then only after labour has commenced, and when, indeed, it has made some progress, that we can positively detect a transverse presentation. We may *suspect* an irregular position, if the os uteri, although flaccid, opens slowly—if the membranes protrude into the vagina rather in the form of the finger of a glove than the round end of an egg—and if we cannot feel any part of the child, even when the finger is carried up to its full extent within the vagina; for it will be easily understood, that when the shoulder presents, the fœtus cannot descend into the pelvis in the same way as when the head or breech offers at the brim, being supported by, and resting on, the alæ of the ilia.

We may also *suspect* that the child is lying transversely, if, when the membranes have ruptured, the uterus ceases to act for some hours; for it often happens that although the pains were frequent and powerful before the membranes rupture, they cease entirely for a considerable time, directly the first stage is completed; and we presume that this is owing to the os uteri having lost the stimulus previously afforded it by the aqueous cyst, while it remained whole; for as the fœtal body is, as it were,

* Mr. Barlow's idea, that preternatural presentations are more frequent under distorted than well-formed pelves, has already been noticed, page 272; and Denman (chap. xiv. section 8) incidentally remarks, "Having been called to women at the beginning of labour, and finding by an examination that the head of the child presented, I have left them for several hours till the first changes were naturally made. When I have examined them on my return, I have found the arm of the child presenting, the head being departed out of my reach. I do not know that any practical advantage is to obtained by a knowledge of these cases; but it is remarkable, that the accident has always happened to women who were deformed. Such cases however should be recorded, and it is possible that some time or other the knowledge of them may be of use. It may lead to an explanation of one cause at least of preternatural labours." One exactly similar instance has happened to myself; and other practitioners must probably also have met with such; but as yet no useful result has originated from Denman's observation.

suspended by the sides of the maternal pelvis, the presenting part cannot immediately subside to the mouth of the womb, as occurs when either the head or breech is protruded first. But we can only *positively detect* a transverse presentation, by distinguishing the different parts of the child, which indicate to us the mode in which it lies.

Progress of the labour.—Labour, then, would most likely at first commence less actively than under a head presentation; the uterus would become somewhat diminished in bulk before the dilating process commenced; but, for the reasons I have assigned, it would not so fully descend into the pelvis as when the head presents. At first the pains would be short and infrequent; they would then become more powerful; the membranes would burst; and after their rupture, the uterus would probably remain an indefinite time inactive. On the resumption of its powers, however, the presenting part would be more or less forced down into the pelvis; and in time, provided the case were left entirely to the natural efforts,—no artificial assistance of any kind being rendered,—one of three things must happen: either the uterus, by its own inordinate action, must rupture its own structure—an accident which is almost invariably fatal; or by a continuance of its strong exertions it must wear itself out, and gradually cease to act, which state will be accompanied by exhaustion, and death will sooner or later occur; or, thirdly, the child's body will be squeezed into a smaller compass—will be propelled through the brim into the cavity of the pelvis, and will eventually pass double: for I can scarcely believe it possible that the woman could survive the entire dissolution of the fœtal body by putrefaction, the separation of its limbs and other component parts, and their evacuation in a disjointed state. The doubled expulsion, or, as it has been called by Denman, the "spontaneous evolution," has, indeed, been occasionally observed, but it is very rare. It is certainly not to be expected, and scarcely can be hoped for if the term of gestation be completed. Provided, indeed, the woman have not exceeded six and a half, or seven months, since the child is then comparatively so small, we may with some confidence look for it; but beyond that period we must be prepared to terminate the labour by art.

Marks of a transverse presentation.—As with regard to the breech, so also in every variety of transverse presentations, there are some marks both negative and positive, which assure us of the particular part that offers at the pelvic brim; and first we will give our attention to that which is the most frequent of all—the

Shoulder.—This part of the child's person is not so large in bulk, nor so hard and bony, as the head; and it has neither the general figure of the head nor its sutures. Again, it is not so large in its rotundity as one of the nates, nor is it so fleshy; we cannot feel the anus, nor the parts of

Fig. 124.

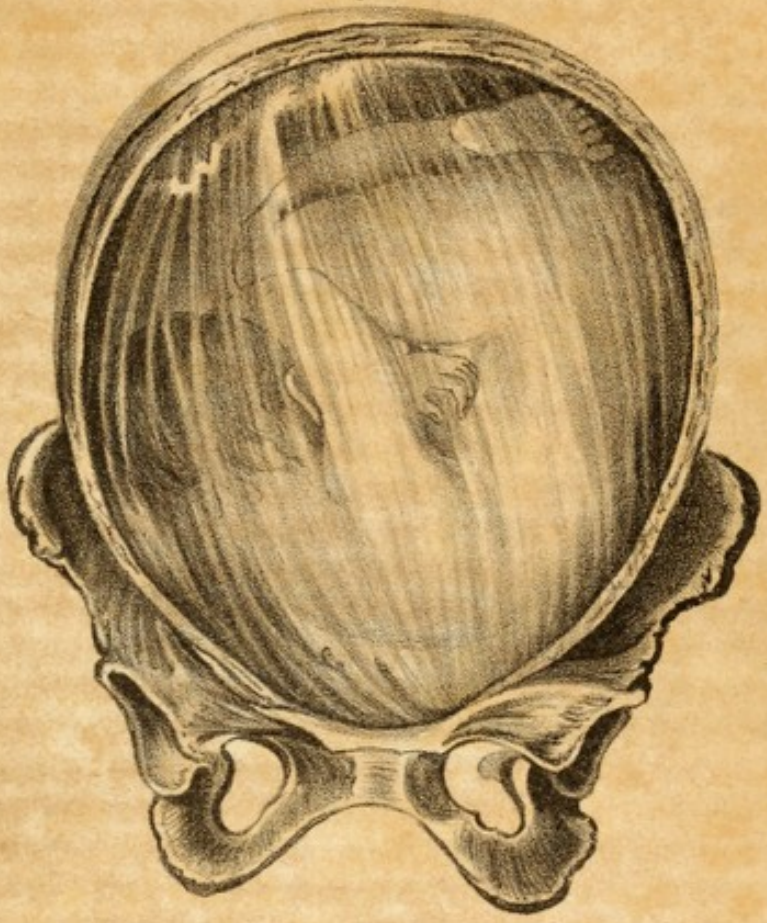


Fig. 125.



Sinclair's Lith.

generation. There is but little chance of our confounding the shoulder with the cranium; but the diagnostic marks between it and the breech are not so easily made out; there is a degree of similarity to the touch between the top of the shoulder and one of the nates, which it is not always easy to particularize. The positive marks are—the pointed acromion, most dependent,—being able to feel the spine of the scapula posteriorly, and the clavicle, and perhaps the ribs anteriorly,—being able to get the finger within the axilla, and not encountering any structures similar to the anus or genitals. If we possess the advantage of discovering all these marks, we can never be disappointed in distinguishing that the presenting part is the shoulder. Plate XLIII. fig. 124 shows the left shoulder presenting at the brim of the pelvis, with the face towards the spine, the membranes being still unbroken.

Elbow.—It sometimes happens that the child presents still more transversely, and the elbow comes down doubled into the pelvis, offering itself in the vagina. Immediately that the elbow meets the finger, we can be positive that a limb presents; we may easily know that it cannot be the head—that it cannot be the breech; but it must be either the superior or inferior extremity. The fœtus, then, may be placed across the pelvis, in that situation which requires the performance of an operation, or it may be so situated that Nature, unaided, may be able to accomplish delivery; so that it is a matter of the greatest consequence to determine accurately which limb it may be. Of all the points of the body, it is most difficult to discriminate between an elbow and a knee. In the knee, however, we have the rounded patella, with its flat surface, which is more or less moveable on the condyles of the thigh-bone. On the contrary, in the elbow we observe the pointed olecranon sharper than the patella; we look in vain for the smooth flat surface which the knee presents, and we can by no means move it from side to side. This last distinctive mark, however, of the presence of the knee, should not have much stress laid upon it, as, in this respect, we are likely to be deceived; for when the leg is turned back on the thigh, the patella is so fixed, in consequence of the extension of the rectus femoris, that its mobility is considerably impeded. Yet, if the other marks are borne in mind, we cannot well be deceived. Should any doubt still exist, let us not lull ourselves into dangerous apathy by calculating the many chances which there are in favour of its being a knee rather than an elbow presentation; but let us institute a more careful examination. If no part of the child's body except the presenting limb is to be felt—provided the membranes are broken—it would be right to bring the folded extremity fully down,—*avoiding, however, all traction*,—so that we may be able to ascertain whether it be an arm or a leg; for even should the shoulder or side be occupying the brim, this proceeding would add no

difficulty to, and not in the least embarrass us in, the subsequent operation of turning.

Hand.—It is not often that the hand presents alone, so that we are unable to feel any other part of the child's body: should that, however, be the case, it would be known from a foot, (and that is the only part with which it can possibly be confounded,) by negative as well as positive signs—by there being no rounded instep—no prominent heel; by the digits not all being in one line. The positive signs are the flattened palm, the fingers being longer than the toes, and themselves not all of the same length, and the thumb forming an antagonist power to the other four. But the being able to feel the hand does not necessarily imply that the child lies in a transverse position; for it is by no means unusual for this member to be placed upon the ear, or by the side of the breech, and to prolapse before either of those parts, as soon as the membranes break; which cases, as will be hereafter proved, require little artificial interference. It becomes our duty, then, as soon as a hand is detected, to examine most minutely, for the purpose of ascertaining whether the head, breech, or shoulder, be at the brim; and to act according to the information we then obtain.

Side.—The side of the child may present, and here also we have some negative as well as positive marks to guide us. The side possesses neither the roundness nor the firmness of the head, nor any sutures or fontanelles; neither is there the double rotundity nor the soft, fleshy feel of the breech: we cannot distinguish the parts of generation nor the anus—we can feel no part of the child except the ribs, and, it may be, the arm also. The side may be principally distinguished by the spaces between the ribs; and if two of these can be clearly traced, there can exist no doubt as to the presentation. The head is the only part of the body for which the side is likely to be mistaken; and I have actually known this mistake occur. If we could only feel two ribs and one intercostal space, it might be possible for us to be deceived; we might suppose the margin of the ribs to be the edges of the parietal bones, and the space itself the sagittal suture. But, if there be any doubt in regard to the presentation, it is better to introduce two fingers of the left hand fully up to the pelvic brim, rather than allow hour after hour to elapse in doubt on so material a question.

Back.—A child may present with its back, Plate XLIII. fig. 125, although this is a very uncommon position for it to lie in. Three or four of the spines of the vertebræ can be felt by the fingers; and we can also detect the origins of the ribs, even before the os uteri is completely dilated. When the back presents, it is of no consequence whether the part directly over the os uteri be near the shoulder or the breech,—whether we feel the lumbar or the dorsal vertebræ; the same thing is required to be done—the

Fig. 126.

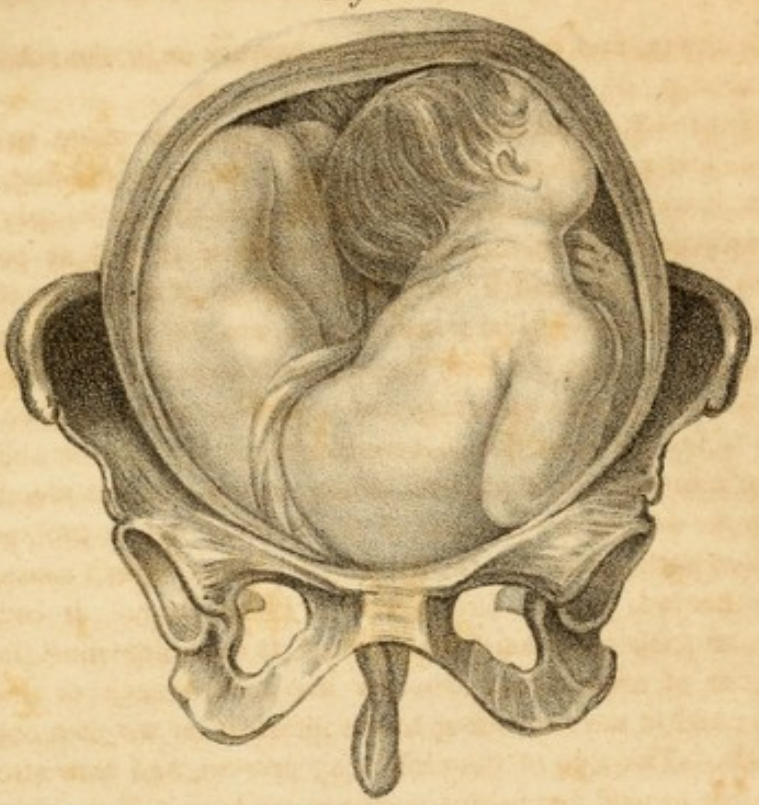
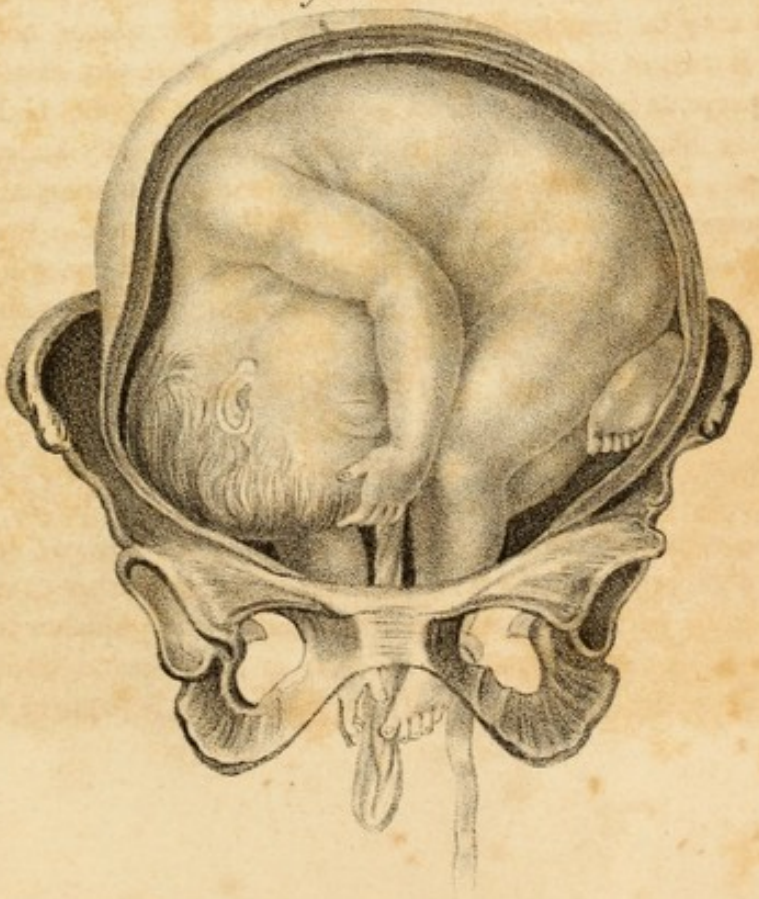


Fig. 127.



hand must be introduced into the uterus, and the breech or the legs must be brought down.

Sternum.—The chest may present,—any point of the sternum meeting the finger. There would be difficulty in detecting this presentation by the first finger of the right hand; but by introducing two fingers, or more, of the left hand, we shall feel the sternal bones, the continuance of the bony plane, the ribs,—or rather the cartilages, at their origin from the sternum,—and the intercostal spaces. This is perhaps a rarer presentation than any of those previously treated of.

Abdomen.—The rarest presentation, perhaps, of all, is the abdominal, Plate XLIV. fig. 126. Out of nearly one hundred and fifty transverse presentations in which I have operated, I have only met with this peculiar position once. If the case were allowed to proceed without interference, the abdomen would be squeezed somewhat through the brim of the pelvis after the membranes break. There can scarcely be a chance of mistaking this presentation. We shall feel the large, soft abdomen, possessing no osseous formation; we shall perhaps be able to distinguish the ensiform cartilage; but a more positive mark is the insertion of the funis nmbilicalis. Whenever we can feel the commencement of the cord by the finger, there exists a belly presentation, most undoubtedly. It must not, however, be supposed that all cases in which a fold of the funis comes down into the vagina must turn out presentations of the abdomen, because the cord frequently prolapses when other parts of the child are at the brim. Plate XXXIX. fig. 118, Pl. XLIV. fig. 127, and Pl. L. fig. 138.

We sometimes meet with more complicated presentations, such as both the hands and feet together, or one of each different limb. Plate XLIX. fig. 127, delineates a case in which a hand, the feet, and the funis offered themselves at the os uteri. In such a case the evident means of relief would be to bring down the feet, and cause the breech to occupy the pelvic cavity. The feet, a hand, and the breech, are not very unfrequently detected together at the pelvic brim; and I have known some few instances in which the head, a foot, and a hand, were all presenting at the same time. If it were practicable under such a complication, it would be most advisable to push the hand and foot above the brim—as will be hereafter more particularly advised—and allow the head to come down alone; if not to turn the child by traction at the foot, and bring down the breech.

Operation of turning.—Having determined that the case under a transverse presentation is not to be left to nature—that it is more likely that the uterus will rupture, or that the patient will die exhausted, than that the child will pass double—we must make up our minds to change its position by operation. First, then, we will inquire in what that operation

consists; and, secondly, what period of the labour we shall select for its performance.

Modes in which the operation of turning may be performed.—Three different modes have been recommended, and they all, perhaps, enjoy their peculiar advantages.

The first is, that we should raise the presenting part, introduce the hand into the uterus, seize hold of the head, bring it to the brim of the pelvis, and convert the case into a natural presentation. The second advice is, that we should introduce the hand into the uterus, run it along the abdomen of the child, take hold of the breech firmly, grasp it with the fingers, bring it to the pelvic brim, and make it a breech case. And, lastly, it is recommended to introduce the hand as high as the fundus uteri, running it along the body of the child, search for the feet, and, bringing down one or both, make the child perform a complete evolution, and extract it footling.*

Of these three modes, that of raising the shoulder and bringing down the head would be the safest to the child, because there would then be little chance of pressure on the funis umbilicalis; and it is that pressure which usually destroys the fœtus, when extracted by the breech or feet; —but although safest for the child it is the most dangerous to the mother, as well as the most difficult to the operator; and the danger, as might be expected, is in proportion to the difficulty. The form, size, and slippery nature of the cranium, all combine to produce this difficulty. Even although the shoulder might be raised from the brim, and pushed entirely out of the way, it is no easy matter to grasp the head, so as to bring the vertex over the centre of the superior aperture; and in these attempts, which will most likely require to be repeated, both the uterus and vagina would be seriously endangered. From the danger and difficulty accompanying this operation, it is now, I believe, entirely abandoned in England as a means of delivery under transverse presentations, although recom-

* The ancients were fully impressed with the danger of transverse presentations; and in the works of Ætius, who was a compiler from previous authors, hints may be found relative to bringing down the feet by turning, under such an unfortunate situation. (Tetrab. iv. sermo iv. cap. 22.) The operation, however, was not generally adopted till the time of Paré, to whom, although he be not the first suggester of this great practical improvement, is justly due the honour of having satisfactorily proved its safety and utility, and enforced its adoption, both by his precepts and example. (Book 24, chap. 26.) Before Paré's time,—the middle of the sixteenth century,—there seem to have been insinuated no precise rules for the management of this order of preternatural cases; it was the almost invariable practice to endeavour to bring the head over the pelvic brim, but, failing in that attempt, most writers directed that the child should be extracted in whatever manner was most practicable. In Celsus, indeed, we find it recommended, that *if the fœtus when transverse cannot be brought into a proper direction*—that is, with the head or feet over the pelvic brim—a hook should be fixed in the axilla, and traction gradually made by it; and that the neck thus doubled should be divided. (Lib. vii. cap. 29.) This advice indeed is given as applicable only to a dead child.

mended by Dubois, as applicable to some few cases. Thus of the fifty-nine cases of presentation of the trunk just adverted to, that happened in the *Maternité* at Paris, he states that two were terminated by bringing the head to the pelvic brim.

Delivery by the breech offers an expedient second in degree safe to the child; for, as already mentioned, when the legs and feet lie up against the child's body, the funis umbilicalis is, to a certain extent, protected from pressure, and the passages having been considerably distended by the transit of the breech, are rendered in a fitter state for the easy escape of the shoulders and the head, than when the feet are first brought down. But this mode of acting is also both difficult and somewhat dangerous, and that from the same causes as embarrass the operator in the attempt to bring down the head. We are not able to encompass the breech readily;—we cannot easily grasp it, so as to bring it over the pelvic brim, in consequence of its bulk and form.

The third means is by far the most dangerous to the child, but by far, also, the safest to the mother—that of grasping one or both feet, bringing the breech, through the hold they afford, into the pelvis, and extracting the fœtus by their agency. This is the mode of delivery now almost universally adopted both in this country and on the continent, and which I would strongly recommend in preference to either of the others, in all cases where there is a necessity for turning the child.

Period when the operation should be performed.—The time most favourable for changing the position of the child is when the os uteri, vagina, and external parts, are perfectly relaxed, while the membranous cyst remains still entire. The operation, then, should be delayed as long as is consistent with the integrity of the membranes, and the preservation of the liquor amnii within the uterine cavity; for the presence of the water allows the easy introduction of the hand completely within the womb, and permits the child to be changed, by means of the feet, in any direction which is desirable. If, then, we have the conduct of the case from the commencement, we should operate before the membranes break.

But again, we cannot—and it would be idle to suppose that we could—pass our hand into the uterus before relaxation of the vagina and dilatation of the os uteri have proceeded to some extent. We could not expect to be able to effect our object, if the os uteri were not opened beyond the size of a sixpence or a shilling, unless, indeed, it were much softer than is usual under this slight degree of dilatation; but when it has acquired the diameter of half a crown, or a crown, it will generally suffer itself to be dilated to such an extent as will admit the hand, without injury to its structure.

Since, then, it may be laid down as a maxim that it is highly desirable,

under a transverse presentation, to change the position of the child previously to the rupture of the membranes, but that it is almost impossible to accomplish this object before the os uteri has acquired a certain diameter—since, also, there is great danger of the membranes breaking as soon as the bag occupies the vagina, so as to press at all upon the external parts—it becomes of importance that we should lay down some rule for our guidance in these cases, not perhaps universally to be followed, but to be classed among our general precepts; and the following seems the most applicable.

As soon as the mouth of the womb is sufficiently open to admit the four fingers and thumb as far as their second joint, we may expect that it will offer but a slight impediment to the passage of the hand, and it would be unwise to delay the delivery until the perfect dilatation of the organ; because, while we are procrastinating, the very accident may happen which it is so desirable to avoid;—the membranes may give way, the liquor amnii may flow out, and the uterine parietes may strongly contract round the fœtal body. Plate XLV. fig. 129. It is possible, however, that before the os uteri have attained the diameter I have just specified, while we are anxiously watching the progress of the case, the membranes may unexpectedly break. Under this unfortunate occurrence, even though we should have some difficulty in dilating the os uteri, we must proceed to the delivery, if it can be effected without injury. It is better that we should act thus than wait patiently for a greater dilatation, during which supineness on our part, the lapse of every minute is adding to the danger and distress incidental to the case.

The principal difficulty in operating previously to the rupture of the membranes will usually be found to consist in the dilatation of the os uteri, the external parts, and the vagina: the difficulty afterwards is not so much in passing the hand up to the mouth of the womb, as in introducing it fully into the cavity; and the difficulty of dilating the orifice, unless preternaturally rigid, is trifling in comparison with that of overcoming the strength of the uterine contractions.

I have remarked that the uterine aperture has been more difficult of dilatation when the labour was premature: and I attribute the resistance offered to the introduction of the hand, under such a case, to the imperfectly developed state of the cervix, rather than to any spasmodic action in the fibres of the os uteri itself.

Mode of turning by the feet.—In the conduct of a case of this kind, then, it is very possible that in our first examination we may not detect positively the nature of the presentation, because the child lies too high for us to reach it easily; but if we find this the case, and that the membranes are coming down in the form of the finger of a glove, these two suspicious

circumstances may awaken in our mind a well-grounded fear that it is a transverse presentation. So long as we are in doubt, we must watch the case attentively, and by no means leave the house, even though the os uteri should not have acquired the diameter of a shilling. But when, in process of time, we have become assured that the child lies transversely, we need not exhibit any indication of anxiety or alarm; we must evade the patient's solicitous inquiries as to the *fairness of the case*, by some general reply, and hold ourselves in readiness to act with promptitude, should the bag of waters break, or any other untoward occurrence take place. At the same time, however, that we keep her in ignorance of the unfortunate position of the child, it is right that we should apprise her friends that it is "a cross-birth;" that there are no dangerous symptoms at present; that she will require to be delivered by art before the labour can be terminated; and that the delivery, as it must be an artificial one, will necessarily be attended with hazard. After this explanation, if a consultation be required, it is much better to acquiesce than take the risk of the event entirely on ourselves.

Having conscientiously discharged this part of our duty, it is not desirable that we should be in constant attendance by the bed-side of the patient, nor make frequent examinations, lest we should rupture the membranes. We have gained all the information we want; we cannot at present afford any assistance, and we may do irreparable mischief. We should pass our finger however, occasionally, in the absence of pain, to satisfy ourselves as to the degree of dilatation that has taken place; and when the os uteri will readily admit the extremities of the four fingers and thumb as far as the second joint, we are warranted in commencing the operation. For the first time, we must now tell the patient that the child is not presenting in the most favourable manner, but that we are about to remedy its unfortunate position; and we may assure her, should she press the subject, that what we shall do will not place her in danger; and that she will not experience more pain in the aggregate than if the presentation were natural, although it may be a little more acute for a short time.

In proceeding to the operation, the first thing to be attended to is the position of the patient, and the second, that she should be confined to a certain posture, so that she may not be able to move out of our reach. Unless we put her in a favourable position, we might as well expect to extract a stone from the bladder with the knees close together, as hope to effect a safe delivery. Dewees,* following Baudelocque† and other continental practitioners, recommends that she should lie upon her back, with the nates brought to project somewhat over the edge of the bed, and the

* System of Midwifery, parag. 682. † Parag. 1135 translation.

feet supported by two chairs at a convenient distance; the legs being separated, and the knees bent. I cannot but think that this posture would be very irksome and distressing to the woman, as well as inconvenient to the operator; and I much prefer the position adopted universally in this country,—which is, indeed, that commonly taken under labour,—on the left side, with the knees drawn up towards the abdomen, and the feet resting against the bed-post. The only alteration required, is that she should be brought near the edge of the bed, that we may have her perfectly under our command. The next point is to restrain her in this position; and this we may accomplish without her knowing that we are confining her at all. We should request a friend to take hold of her hand; so as to steady the shoulders. Women know that in common labour, when the expulsive pains come on, they are much assisted by fixing the upper part of their person, through the means of a towel fastened to some unyielding point; and they therefore seldom object to grasping the hand of a friend instead. We must not fail, however, to give this assistant a previous intimation to resist any efforts which she may make to draw herself away. The nurse must then raise the right knee, and separate the legs; by which also the pelvis is steadied in one situation;—and unless the patient makes a violent effort, she is not likely to move far away. The operator must take off his coat, for without this precaution he will necessarily be foiled: if he simply bends back the cuff, the hand is only admitted half within the uterus, and no advantage can be gained; should, indeed, the sleeve even allow of being turned up above the elbow, it compresses the biceps, cramps the other muscles, and prevents the free motion of the arm. The left arm* and hand must be bared, and anointed with some

* The recommendation that we should use for this operation, the *left* hand in preference to the *right*, is grounded on what I consider four very valid reasons, presuming that the patient is placed on her left side. *First*, when the tips of the fingers are brought nearly together, so that the hand resembles a cone, and forms somewhat of a wedge, the left hand enters the vagina more easily than the right, passing upwards in the direction of the axis of the external parts. *Secondly*, when it is lodged in the vagina, fully occupying the pelvis, the knuckles of the left hand adapt themselves completely to the cavity of the sacrum, and the hand itself is carried up to the brim in the direction of the axis of the brim, following the curve of the canal. *Thirdly*, when it is passing the brim, while dilating the mouth of the uterus, and entering its cavity, it then takes the direction of the axis of the uterus, which lies with its fundus forwards, and its mouth looking back towards the sacrum. *Fourthly*, when the left hand is in the uterus, an opportunity is given us of steadying the uterine tumour externally by the right, carried between the woman's thighs and placed on the abdomen. The consent between the two hands affords an infinitely greater facility in action, than could be attained by the aid of any assistant. An act of volition is all that is required in order to a co-operation of these two members;—the mind begets the thought, and at the same moment the limb performs the deed willed. But if we have to give directions to a party standing by, time is lost, the progress of our proceedings is interrupted, and the probability is that our orders will be obeyed in an imperfect and faulty manner. If the *right* hand be attempted to be passed into

unctuous application; care being taken not to grease the inside of the fingers, or the palm. Kneeling then by the bed-side, rather than sitting, he must bring the tips of the fingers and thumb close together, nearly into the same level; and thus, forming the hand into the shape of a cone, commence the process of dilating,—with the utmost delicacy and caution,—first the external parts, next the vagina, and lastly the os uteri itself. While thus introducing the hand, it is better not to pause until it be fairly passed within the uterine mouth,—unless, indeed, more than ordinary opposition be experienced,—and he must by no means withdraw it, lest he lose the advantage he has already gained; he must therefore be prepared to withstand the entreaties of his patient that he should desist from the attempts he is making.

The stimulus of the hand will most probably occasion an accession of uterine contraction, and the membranes will be protruded downwards against the extremities of the fingers, and burst without any effort on the part of the attendant. A small quantity of liquor amnii will escape externally; but as the pelvis is more or less occupied by the hand and arm, a plug is formed, which prevents the entire evacuation of the water; so that this fluid being retained in the uterus, permits the child to make a perfect and easy evolution. The membranes being broken, the hand enters into the centre of the cavity of the ovum, and comes into immediate contact with the fœtal body.

It is not *absolutely necessary*, before proceeding to the operation, minutely to ascertain the position in which the fœtus lies—although to have obtained such knowledge might be *desirable;* for the fingers being carried round to the chest, the hand may be slid along the abdomen until one or both feet be felt; they must be firmly grasped, and the breech carefully and slowly brought down into the pelvis. I think it highly desirable that both feet should be taken hold of, if they lie together and can be commanded by the same effort, because the evolution is so much more

the uterus while the woman lies on her left side, it will be immediately seen that the knuckles are opposed to the under surface of the symphysis pubis, that the tips of the fingers will rub against the cavity of the sacrum, and that the wrist must be bent far backwards, before the hand can enter the uterine cavity. To effect this object indeed we must place ourselves completely behind the patient, which is an awkward posture for ourselves, and not always to be accomplished. It may be answered, that as the right hand is used by most persons in the ordinary occupations of life, in preference to the left, they therefore have recourse to it in all acts requiring any nicety of manipulation. But the greater degree of command which we possess of one hand over the other is almost entirely the effect of habit; and every young surgeon should accustom himself to use each in many offices connected with his profession,—such as bleeding for example,—indiscriminately. If he follows this advice, he will soon find himself as apt with his left hand as his right.

easily accomplished when both are brought down; but if one only be obtained, it is neither necessary nor proper that we should spend time, and inconvenience our patient, by searching for the other.* The breech being in the pelvis, the principal difficulty of the case is over; it is reduced to one of the first order of preternatural presentations, and must be terminated by the rules before laid down. Some have recommended that, after the feet are extracted, we should leave the case to be concluded by uterine action; but the highest authorities all agree that it is better to terminate it by a continuance of artificial efforts—gently, tenderly, and cautiously applied—taking advantage of the assistance of the pains, and avoiding all hurry or violence.

Simple and easy as this operation may be to an expert hand, it is by no means unlikely that a younger practitioner will become somewhat embarrassed; and there are some other points, therefore, to which we must devote a portion of our attention, besides the precepts already given.

In all instances where it becomes necessary to form this artificial change in the situation of the fœtus, a piece of strong tape should be procured, at one end of which a running noose must be made, to be applied, if requisite, over the fœtal ankle; Plate XLIV. fig. 127; for this will assist us materially in bringing down the breech, provided any difficulty be experienced in causing the child's body to revolve. This is, indeed, particularly useful, and almost indispensable, when the operation is performed under a strongly-contracted uterus; and its mode of adaptation will be discussed when such cases come under review.

Again, before proceeding to the operation, it is right that we should satisfy ourselves that the bladder is empty; and if distended, it should be evacuated, either by the voluntary efforts of the patient, or by the catheter. We are recommended by some practitioners,† indeed, to throw an enema into the rectum in all cases, as well as draw off the urine. If the bowels be much loaded, such a precaution may be highly proper, for the purpose of ensuring as much room in the pelvis as possible, but ordinarily it will not be required; and if not necessary, may be hurtful, partly by complicating our duty, partly by the loss of time which must attend its adminis-

* Mr. Radford, of Manchester, whose great experience in difficult cases of obstetric surgery renders his opinions highly valuable, counsels us "never to bring down more than *one foot* in the manual operation of turning;" (Essay 4th, on Difficult Parturition, p. 15;) because the other thigh, being flexed upon the abdomen, offers a larger circumference than if it were extracted, and thus prepares the passages for the more easy transit of the shoulders and head. The advantage of this practice consists in its affording greater safety to the child; the disadvantage, in its creating more difficulty in accomplishing the evolution.

† Barlow (Op. Cit., p. 210) says, "On all occasions when the introduction of the hand into the uterus is required, it is necessary that the contents of the bladder and rectum be previously emptied."

tration, but principally from the stimulus which may be propagated to the uterus, and which may excite increased action in that organ—a circumstance we should be solicitous to avoid, at least before the introduction of the hand.

Nor is it of small importance that we should be perfectly certain that it is a foot we have grasped, before proceeding to extract; for if we allow ourselves to be thrown off our guard by agitation, or anxious to finish the delivery, are seduced into reprehensible haste, and, by mistake, bring a hand down into the vagina, the shoulder will come to occupy the brim; the fœtus will still be transverse, and we shall have to renew our attempts at "turning" under very much increased difficulties. The two limbs may be discriminated from each other by the marks before enumerated. (Page 306.)

After the arguments already used, it is unnecessary for me to impress the caution, that force in the introduction of the hand, being never called for, is to be deprecated in the liveliest terms; that hurry in the extraction of the child is not desirable, and seldom necessary; and that nothing can warrant us in having recourse to violence. And I trust I may be excused for insisting on the necessity of the hand being directed by the mind, even in the most trifling of our proceedings; and for conjuring the young practitioner ever to bear in remembrance—during this as well as all other obstetrical operations—the delicacy of the structures within which he is acting.

Turning when the uterus is contracted round the body of the child.—The operation of turning when the uterus is strongly contracted, is one sometimes of considerable difficulty; and under such circumstances the infant is seldom saved. It will rarely occur to the experienced practitioner to meet with an aggravated case of this nature, when he has had the conduct of it from the commencement; because he will most likely have detected the position of the fœtus before the membranes break, and will have seized the first favourable opportunity for rectifying its unfortunate situation. But being called when the waters have been some time discharged, it will become a question for careful deliberation, whether we shall leave the case, in the hope and expectation that the child will pass double; or whether we shall attempt to assist Nature under difficulties which we fear she will be unable to surmount. As it would be unsafe to trust the delivery to Nature, we must accomplish it artificially; and we may either proceed to its completion immediately, or prepare the patient previously, by attempting to lessen the powerful action of the uterus. On this question the opinion of practical men is divided—some advising us not to delay a minute, others declaring that we should run the risk of injuring the uterus if we attempted to pass the hand during its contracted

state; and that therefore we ought to stay our endeavours until we have obtained that truce which is so desirable, and, indeed, necessary:—and the instructions of each party are perhaps applicable to certain peculiar cases, and therefore within certain limitations to be followed. I am myself an advocate for the operation being performed as early as is compatible with the woman's safety; and I have almost invariably found that if due caution be observed, it can be accomplished without the necessity of placing her under that severe and rigid system of treatment deemed requisite by some.

The advocates for the practice of delay in those cases where the fœtal body is strongly compressed by the powerfully-contracted uterus, instruct us to abstract twenty or thirty ounces of blood, so as to occasion syncope; and to avail ourselves of the state of relaxation which it is presumed will follow, for the fulfillment of our intention. If, notwithstanding the supervention of faintness, we cannot succeed in introducing the hand, to employ that agent which is supposed to rank second in effect in relaxing uterine contractions, softening rigid fibre, and overcoming clonic spams—opium: we are taught to exhibit eighty or one hundred drops of laudanum immediately; and, waiting a little for the operation of the drug, to make another attempt. If, after the lapse of some time, we are still unable to insert the hand, we are recommended to exhibit twenty or thirty drops more at intervals, till we find that relaxation has taken place. The use of poppy fomentations to the vulva is advised; and it is also suggested, that where practicable we might try the relaxing power of the warm bath. The tobacco enema is spoken of as being one of the most likely means to produce relaxation; although dreaded as a highly dangerous remedy. Failing, however, to effect our object by these various means, it is then recommended that we should wait till the uterus is worn out by its own powerful contractions, and that we should take advantage of the quietude induced by exhaustion.*

Notwithstanding the high names by which these measures come recommended to our notice, from most of them I entirely dissent, and, therefore, think it my duty to deprecate their use; because it is not so much the immediate delivery of the patient that we have in view, as her ultimate safety. If, then, by such means as bleeding, opium, tobacco, or any other depressing or narcotic agent, we bring the system into such a torpid state as completely to remove uterine contraction, we deprive the woman of that very power which is to place her in safety after her delivery; and we prevent the closure of the uterine vessels, a patulous state of which must lead to fearful hæmorrhage. I cannot help thinking that if we deliver the

* See Blundell's Obstetricy, by Castle, p. 402.

patient either while under syncope from bleeding, or stupefaction from opium or tobacco, we should be emptying the uterus at a time when it could not exert its contractile energies; we should consequently leave it in a flaccid state, and bring the patient into the greatest peril. Besides, I very much doubt the power of these means to ensure the end proposed; for it is not only the occasional action of the uterus which prevents the introduction of the hand, but the permanent contraction of its fibres, which is induced by, and consequent upon, that occasional action. When the difficulty merely arises from the violence of the labour pains, we may gradually insinuate the hand during the interval of action; but when a *permanent* decrease in the capacity of the uterine cavity has taken place, through a continuance of that occasional or intermitting action constituting the throes of parturition, a state of tonic contraction is induced, which is constant and unyielding, and which it would be fruitless to endeavour to remove either by bleeding, opiates, or any other antispasmodic power. Of all the expedients spoken of, bleeding and fomentations are perhaps the only ones which I would be inclined to employ; and these not with the view of taking off uterine contraction, but of subduing inflammation of the structures consequent on pressure.

Should, then, this reasoning be correct, and should the means so confidently recommended prove of little or no avail, they must be injurious in the same proportion as they depress the system, and it would be unwise to rely upon, or indeed to adopt them; especially as other modes of delivery are placed within our reach,—when judiciously-directed efforts at turning fail,—without subjecting the patient to such additional causes of danger.*

* The observations I have ventured to make in the text are not founded on speculative reasoning, but are the result of somewhat extended practice. Between the years 1823 and 1834, I delivered more than one hundred and twenty women under transverse presentations, independently of a few cases to which I was summoned where spontaneous evolution occurred. Many of these cases presented a formidable appearance; for in one, the membranes had been ruptured a whole week; in another, sixty-nine hours; in a third, fifty-eight hours; in another, fifty-five; in another, fifty-three; and in many, more than forty-eight: and as a general principle, we presume that the longer the liquor amnii has been evacuated, the more likely is the uterus to have embraced the fœtal body firmly, and the more difficulty will there be in overcoming the resistance. In none of these cases did I exhibit large doses of opium, and in those few where bleeding was practised, that operation was had recourse to, not for the purpose of relaxing the rigidity of the uterine fibres, but to relieve the inflammation which the soft structures were suffering, and to remove tumefaction. In not one of these instances was any injury inflicted on the uterine structure; nor did any permanent evil arise as a consequence of the operation. In four cases only was the uterus so powerfully contracted as to refuse admittance to the hand, and compel me to adopt the alternative of exviscerating or decapitating the fœtus. I have instanced eleven years only, because since that period I have not had leisure to reduce to a tabular form the result of my practice, and therefore cannot speak with positive certainty in regard to the details.

Feeling so strongly on this subject, I think it my duty to recommend that, in all cases where the membranes have been broken for some time, delivery should at once be proceeded in, provided the vagina and vulva be relaxed, and not swollen from inflammation, and provided the os uteri also be fully open: and if the endeavours of the attendant, judiciously directed and steadily persevered in, be frustrated, that he should pause, and consider carefully and attentively every circumstance connected with the case; that he may inform himself of the particular cause of the extraordinary difficulty he experiences. I would only again urgently caution every young practitioner against using undue exertion—against endeavouring to overcome the resistance by force or sudden jerks, rather than by a continuance of gentle means—and against *forming a resolution to deliver* by turning at all hazards; and I am persuaded, if the recommendations hereafter to be submitted, be followed, he will be able to effect the requisite change in the position of the fœtus, and avert the necessity of having recourse to the severe measures adverted to—provided, indeed, the version can be accomplished at all.

Mode of performing the operation.—Although, when speaking of turning the child while the uterus was still distended with the waters of the ovum, I stated it as my opinion that it was not absolutely necessary to acquaint ourselves positively with the peculiar position of the fœtus—both because when the hand is introduced into the uterine cavity it can be carried easily along the body of the child until one or both feet be felt, and because of the difficulty of detecting the exact mode in which it lies previously to the rupture of the membranes—the case is very different when the uterus is strongly contracted; it then behooves us to ascertain most distinctly its situation before we attempt to remedy it: and this information it is not difficult to gain, by observing which hand protrudes, and attending to the direction of the palm. We know the right hand by the thumb being opposed to our own when we place the palms together; and we know that the palm of the child's hand must be looking in the same direction as the abdomen, unless the arm be twisted. Thus, then, if the right hand be external, with the palm directed anteriorly, the head must be lying on the right ilium, and the face must be looking forwards: if the right hand be down, with the palm towards the anus, the head must be placed on the left ilium, and the face turned towards the spine: if the left hand be protruded, with the palm forwards, the head must be on the left ilium, and the face looking to the abdominal muscles; and if the left palm be directed backwards, the head must be on the right ilium with the face towards the spine. Having learned, then, on which side the head lies, we know that on the opposite we shall find the breech; and having ascertained whether the face is situated anteriorly or posteriorly, we know also that towards

the same part of the uterus we shall encounter the legs; and thus, so far as guiding our hand immediately to the child's feet is concerned, our operation is much simplified.

But it is possible that neither of the fœtal hands may be protruded externally, although the membranes may have been ruptured for some hours, and the shoulder may be fully occupying the pelvic brim;—the elbow may be situated in the vagina doubled. Under this state, it might be difficult to distinguish the right from the left extremity, by making our observations on the arm itself alone; and it is much better quietly and tenderly to unbend the limb, so as to bring the hand down, than to commence the operation in ignorance of such an important point.

It may perhaps be asked, why should we bring down the arm, and impede the subsequent steps of the operation by filling up the pelvis with the limb?—I would answer, that it is not the arm which prevents us making the evolution; it is the shoulder and the body of the child blocking up the pelvic brim, together with the strength of the uterine contractions: it is, indeed, of little consequence whether the hand is external, or whether the arm is doubled, the elbow presenting in the vagina. And if we have any doubt as to whether the presenting limb be the right or the left arm, it appears to me the best practice with care to bring it fully down.

Some practitioners advise, that if the palm be looking towards the mons veneris—inasmuch as the feet must then be placed anteriorly in the uterus—the right hand will be more conveniently used than the left; because that hand, traversing the fore part of the uterine cavity, passes up at once to the very spot where the feet lie.* If the right hand, indeed, adapted itself as well to the axis of the external parts, to the curve of the sacrum, and to the axis of the uterus, as the left does, it would, no doubt, be much preferable: but as this is not the case, and as, by simply directing the left forwards, through rotation of the wrist, upon its admission within the cavity, we can, without much difficulty, reach the feet, I am, even in this position, inclined to recommend its employment.

We will suppose, then, we are consulted in a case of this serious difficulty, where the membranes have been ruptured for some hours, the hand protruded externally, swollen, and somewhat livid; the shoulder and chest occupying the brim of the pelvis, and the uterus contracted powerfully around the child's body. Having ascertained the exact position of the fœtus, by the direction of the different parts of the hand, before proceeding

* Velpeau Treatié de l'Art des Accouchemens, edit. Brux.; p. 388. Conquest, Outlines, 1837, p. 128, and others. Blundell, Castle's edit., p, 394, without prescribing any fixed rule, favours this practice.

to turn, it would be right to make an accurate examination of the abdomen externally; by which we may learn the degree of contraction that the uterus has taken upon itself, and form some opinion of the probable resistance we are likely to encounter. We also make ourselves acquainted with the general magnitude of the organ, and may judge whether the woman has advanced to near the close of gestation. It is very possible that she may have gone into labour prematurely; and if, on placing the hand on the uterine tumour, we find it so small that it has sunk considerably within the pelvis, we should relinquish the idea of an operation for two reasons; first, because we should be foiled in endeavouring to introduce the hand into so small a space as the cavity under such circumstances possesses; and, secondly, because in all probability the fœtus will pass doubled. Should the patient unhesitatingly inform us that she is persuaded she has not exceeded six and a half, or seven months, we may then generally trust the case to nature; but, beyond that period, an operation will mostly become requisite.

The position and general management of the patient must be such as I have before described. Having taken off our coat, turned up our shirt sleeve, and anointed the left hand and arm as far as the elbow, avoiding the inside of the fingers and palm, we must kneel by the bed-side, and, forming our fingers into the shape of a cone, we must insinuate them cautiously through the external parts, up to the os uteri; then, laying the hand flat upon the child's person, we endeavour to introduce it either anteriorly or posteriorly, according as the feet lie, sliding it upwards along the fœtal body. It may sometimes avail us, in this step of the operation, to raise the shoulder somewhat from its position; but this is generally difficult to accomplish, and not without its dangers. If the uterus be contracted powerfully, and our attempts are made without great care, we may thrust either our own hand or the child's body through the uterine structure, to the almost inevitable destruction of the patient. It is more than probable that the stimulus of our hand may occasion an accession of uterine action, which we are made sensible of both by the complaints of the woman, and the propulsion of the child's body downwards: we must then for the present, desist from farther endeavours, (keeping our hand flatly spread out on the child's body, lest the irregularities of the knuckles might injure the uterus,) and resume them in the interval of action. In this way, by little and little —making progress slowly, but steadily, only pressing forward in the absence of pain, laying the hand extended on the child's person during the return of uterine action, preserving all the advantage we have gained, and being most careful not to withdraw it,—we carry it fully within the uterine cavity to that part in which the feet are placed: grasping them both,

if they lie together, or one only, if there is any difficulty in finding the other, we tenderly bring the limb down, through the os uteri, into the vagina. If the fœtal body be closely embraced by the contracted uterus, and especially if the shoulder be at all wedged in the brim of the pelvis we shall find that, although the foot descends into the vaginal cavity, still the shoulder does not recede, and the child does not perform the necessary version to allow the breech to pass down so as to occupy the pelvis; and the greater exertion we make to draw the foot outwards, the more firmly does the shoulder become impacted in the pelvic brim. It is evident, then, unless we can raise the shoulder, that we shall not procure a space into which the breech can descend; and if we endeavour to push the upper part of the child's body out of the way, while we are using no extractive power to bring the breech down, we shall not only not succeed in our endeavours, but the foot will escape back again into the uterine cavity. Now, as the vagina is not sufficiently capacious to admit both hands at the same time,—with one of which we might raise the shoulder, and with the other draw down the breech, by means of the leg,—it will much assist us to get a noose of strong tape fixed round the ankle, while still in the vaginal cavity; nor shall we find much difficulty in the adjustment; and when applied, traction downwards, in a line tending towards the coccyx, may be made by it, while a steady pressure upwards is exerted by the extremities of the fingers placed against the axilla or the ribs. By this double effort the shoulder can be raised,—although that was impossible before the leg was brought down,—because room is made for its recession by the descent of the breech, while at the same time a space is formed for the reception of the breech by the ascent of the shoulder. The breech, then, having been made to occupy the pelvis, the case is reduced to one of the first order of preternatural cases, and must be managed by the rules before inculcated.

I freely confess that sometimes it is most difficult, if not impossible, to introduce the hand so high into the uterus as to arrive at the feet, because they may lie at its very fundus, and it may be dangerous to attempt to overcome the strength of the contraction which the uterus has taken on itself. It has happened to me, in working the hand along the body of the child, to have passed it as far as the breech, to feel the legs doubled up, but not to be able to reach a foot. In such a case I have not thought it right to make a strenuous effort in order to encompass the feet, but have satisfied myself with hooking a finger in the ham, and making the child revolve by the power that purchase afforded. It must not, however, be overlooked that this practice is far from being unattended with danger; because an arm may be mistaken for a leg,—the bend of the elbow for that of a knee; and it would be unsafe for any one to have recourse to it,

until his experience enables him with certainty to discriminate the one limb from the other.*

Spontaneous evolution.—It was a remark first prominently set forth by Denman, that occasionally, under a shoulder presentation, after the membranes had been broken some time, the uterus acting with considerable energy, the body was forced down into the pelvis, and an unassisted termination of the case occurred, the breech being expelled first. To this peculiar change of position, effected by nature, he gave the term "spontaneous evolution;" and he has supplied us with his idea of the mode in which it occurs, in the following passage:†—"I presume that, after the long-continued action of the uterus, the body of the child is brought into such a compacted state as to receive the full force of every returning action. The body, in its doubled state, being too large to pass through the pelvis, and the uterus pressing upon its inferior extremities, which are the only parts capable of being moved, they are forced gradually lower, making room, as they are pressed down, for the reception of some other part into the cavity of the uterus, which they have evacuated, till the body, turning, as it were, upon its own axis, the breech of the child is expelled, as in an original presentation of that part." He afterwards says,—"Premature or very small children have often been expelled in a doubled state, when the pelvis was well formed, or rather more capacious than ordinary; but this is a different case to that which we are now describing." The ideas that Denman had formed of this unusual occurrence were generally received by the profession as the true explanation, until Dr. Douglas of Dublin, in a pamphlet first published in 1811, showed clearly that the description was incorrect. He observes, "that it is incompatible with the received ideas of uterine action to suppose that the uterus, when contracting so powerfully as to force down that part of the child which was at its fundus, could at the same moment form a vacuum, into which another portion, already low down in the pelvis, should recede."‡ Dr. Douglas, then, first gave us a true history of the process; and he has proved that the fœtus actually does pass the pelvis in a doubled state, although denied by Denman. He

* Campbell (Mid. p. 286) recommends, in all cases of turning, that the knees should be grasped instead of the feet; as was first recommended by Dr. Breen, Edinburgh Med. Surg. Journal, vol. xiv. p. 30.

In one instance, when the irregular action of the fibres of the fundus prevented my arriving at the foot, after having passed my finger round a ham, not possessing sufficient power to cause the child to revolve, I directed a small blunt hook by the side of my finger, and keeping the point well guarded, made traction by it, and accomplished my purpose; but such a proceeding must be attended with some risk.

† Introduction to Midwifery, chap. xiv. sect. 8.

‡ Explanation of the real process of the "Spontaneous Evolution of the Fœtus," 1819, p. 27.

Fig. 128.

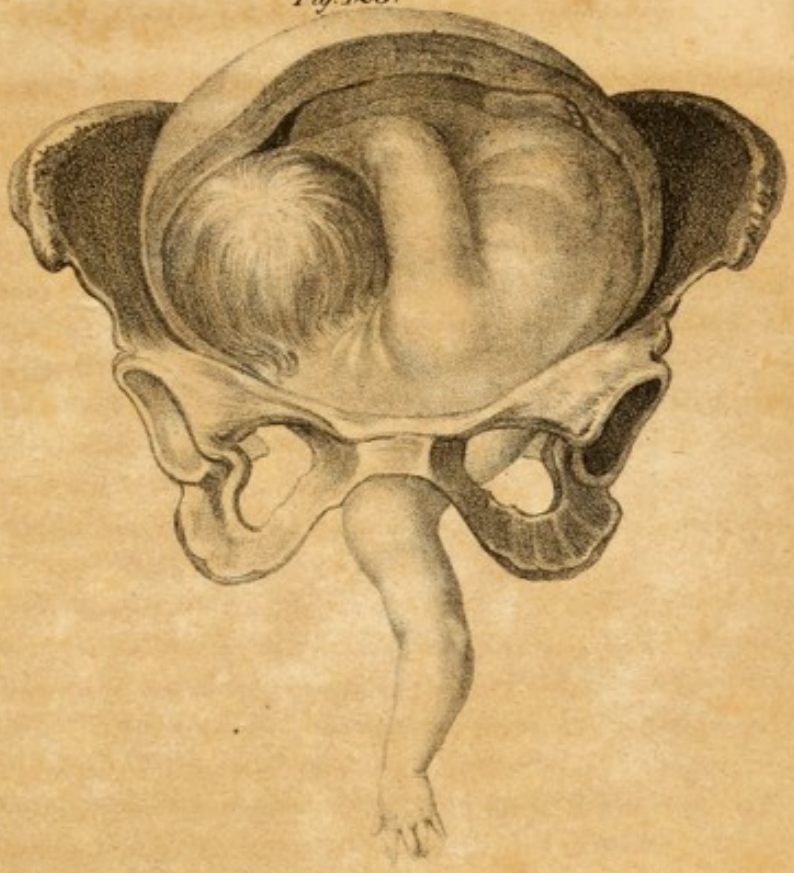


Fig. 129.



Sinclair's Lith.

has described it, as indeed I myself have witnessed, to be accomplished in the following manner:—By the continuance of the powerful uterine contractions, the whole of the arm is protruded externally, the shoulder and chest being propelled low into the pelvic cavity. The acromion then appears under the symphysis pubis; and as the loins and breech descend into the pelvis at one side, the apex of the shoulder is directed upwards towards the mons veneris. Farther room is thus gained for the complete reception of the breech into the cavity of the sacrum, and that part of the child's body is eventually expelled, sweeping the sacrum, and distending the perineum to a vast extent. As, during the whole of this process, the head remains above the pelvic brim, it is evident that, the apex of the shoulder being external, the clavicle must be strongly pressed against the under surface of the symphysis pubis: on which point, indeed, the fœtal body partially revolves, as on an axis; the other shoulder and arm, and the head, being expelled last. Plate XLV. fig. 128. The pelvis is represented filled by the chest and abdomen of the child; the left shoulder below the symphysis pubis; and the breech entering the cavity within the left ilium.

We cannot reasonably expect this doubled expulsion to occur, unless the patient possess a larger pelvis than ordinary, or unless the fœtus be preternaturally small or premature; nor, indeed, except under a long continuance of powerful and expulsive pains. But the knowledge of the fact, however rare its occurrence, must be considered of much importance practically; for if we saw good reason to believe that delivery was likely to be effected in the manner just detailed, we might be inclined to leave the case to the unaided efforts of nature, and hope for a fortunate termination.*

But another practical advantage has been also gained by observing the phenomena that I have mentioned—namely, the institution of an operation in which the process may be imitated, wherever it is found impossible to deliver by the more ordinary method of turning; and this consists in diminishing the bulk of the fœtal body by the removal of the viscera; an opportunity being thus afforded it to collapse, so that it may be extracted without much difficulty.

Exvisceration.—It must not be imagined that the operation of exviscerating the fœtus is intended to supersede the practice of turning under

* I have personally known seven cases of this description, in all which my assistance was desired; and I was present at four of them during the expulsion of the fœtus through the outlet of the pelvis. Three of the children were born alive; two of them were twins; all the rest except one, (which was at full time,) were premature, being expelled between the sixth and seventh month.

transverse presentations. It is only to be had recourse to as a last resource, when many hours have elapsed since the rupture of the membranes —when the fœtal body is so firmly wedged within the pelvis, or at the brim, that the introduction of the hand into the uterus is rendered impossible, or would be evidently attended with most imminent danger.

In modern times this operation was first recommended by Douglas, and in this city, I believe, first resorted to by my father. In itself it is not difficult of performance, and requires merely the use of the same instruments employed for perforating and extracting the head. The woman lying on her left side, an assistant should be directed to bring the chest as fully into the pelvis, by traction at the arm, as possible; the perforating scissors, guided by two fingers of the left hand, should be carried against one of the intercostal spaces, and a free opening made. Plate XLV. fig. 129. One or more ribs may be divided, if necessary, so that two or three fingers, or the whole hand, can be introduced within the aperture. Through this incision the contents of the fœtal thorax must be extracted; the diaphragm may be perforated afterwards, and by the same opening the liver and intestines evacuated. The body, thus deprived of the principal part of its contents, will collapse; and if the uterus continues to act with vigour, will be expelled doubled, the breech following the curve of the sacrum and perineum. But should the pains have ceased, artificial extraction may be most beneficially made by means of the crotchet carried through the opening, and fixed within the fœtal ilium; the breech will soon be observed to descend, and the case will be terminated as though Nature had expelled the child unaided.

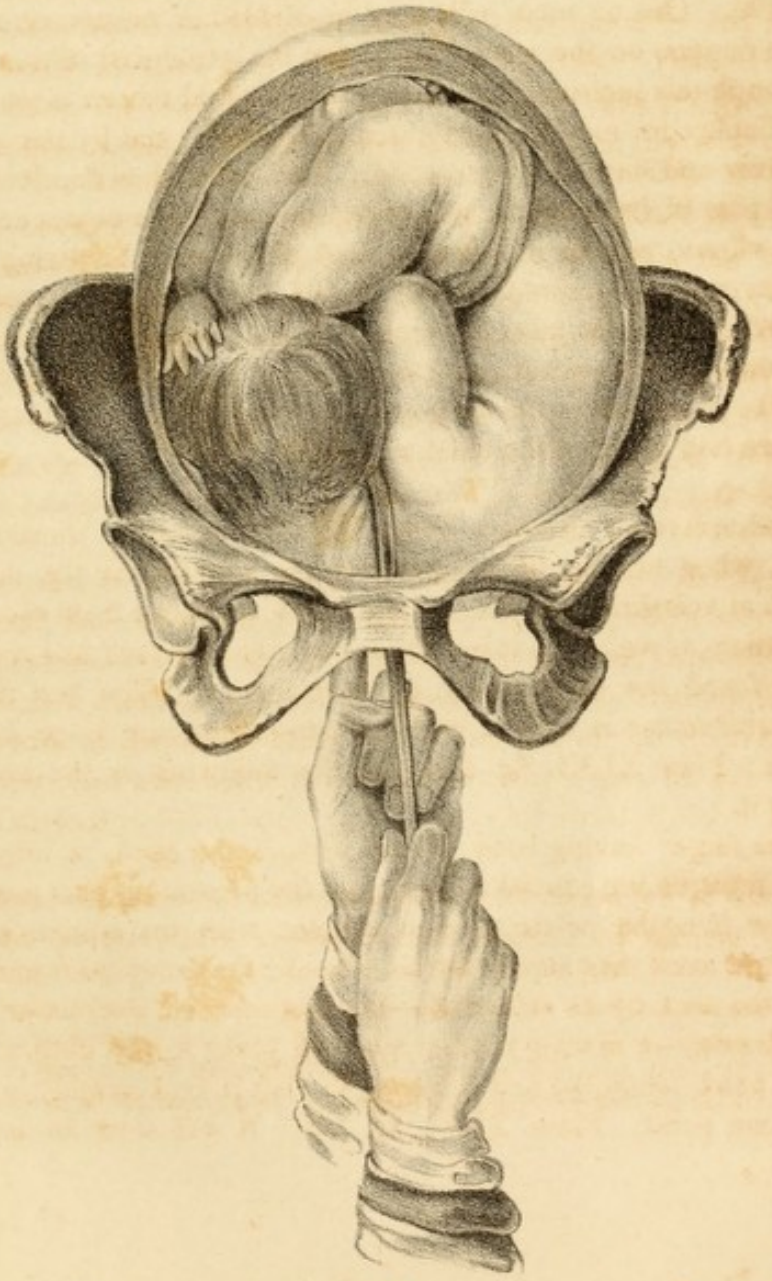
Decapitation.—Another means of delivery under transverse presentations, when turning is impracticable, is afforded by the division of the cervical vertebræ, and the separation of the head from the trunk. This operation, as well as that last described, I have myself had recourse to, and have found the difficulty by no means great. The best instrument for its performance is a hook with an internal cutting edge, formed by my father; Plate XLVI. fig. 130, and the following is the best method of using it.

The finger having been passed around the neck, a large-sized blunt hook must be introduced upon it, and the presenting part must be brought as low into the pelvis as is consistent with the woman's safety. An assistant must then steady the blunt hook; the decapitator must be directed over the neck by its side, and,—the first adapted instrument having been withdrawn,—a sawing motion must be given to the cutting hook by the right hand, while the first finger of the left is kept steadily in contact with its blunt point. Plate XLVI. fig. 131. It will soon be found that the

Fig. 130.



Fig. 131.



Sinclair's Lith.

structures give way, and that the separation is effected. The child's body must then be drawn out by which ever arm may protrude, and the head extracted by a crotchet or blunt hook introduced into the foramen magnum, or the mouth; nor will its removal generally offer much, difficulty, unless the pelvis be contracted in its dimensions. I can scarcely suppose it possible for any case of transverse presentation to occur, which might not be terminated by one or other of these operations, provided turning could not be accomplished;—unless, indeed, the pelvis be distorted in an extreme degree, or almost fully filled by a solid tumour. For if the chest be much pressed downwards, occupying a large portion of the pelvic cavity,—although it would be difficult to surround the neck so as to amputate the head,—perforation of the thorax would be easy, and delivery could be perfected through its means: while if the child presented, as occasionally happens, with the neck directly over the pelvic brim, then there could be little trouble in passing the finger round that part, as a guide to the cutting hook; although to perforate the chest under such a presentation would be dangerous if not impracticable.

Plate XLV. fig. 129, and Plate XLVI. fig. 131, show the mode of performing these two operations. A front view of the pelvis is given in both the illustrations; but it must be remembered that in practice the woman must be placed on her left side.

I can fully appreciate the horrifying feelings with which the reader must be impressed, whilst contemplating the details of two operations apparently of the most barbarous and savage nature—the shudder which he must experience on finding any person hardy enough calmly to sanction and advise the decapitation, or disembowelling, of a fœtus in utero. Surely, however, I need not add, that such modes of delivery should never be thought of unless the fœtus be dead; nor, indeed, can they ever be necessary until life is extinct; for if the chest be so firmly impacted in the pelvis as to prevent the introduction of the hand into the uterine cavity, the pressure to which the heart itself would be subjected must destroy the existence of the fœtus, independently of the great chance that fatal compression will take place on the umbilical vessels, both in the cord, and after their division upon the placenta; so that our feelings on that account can never be wounded.

Many of the ancient writers* recommend that, when the arm is protruded externally, it should be amputated at the shoulder-joint: this practice has been pursued in late days; and I have known instances in which

* Ætius, tetrab. iv. sermo iv. cap. 22 et 23.—Heister, cap. 153, parag. 6, says, "Si vel propter nimis tumidum brachium, vel propter uterum nimis constrictum, manus chirurgi in uterum demitti nequeat, *vel extorqueri ex scapulæ articulo*, vel quàm cautissimè *rescindi brachium juxta humerum oportebit.*"

it has been carried into effect. From such a recommendation, however, I most strenuously dissent; because the removal of the arm cannot, in the slightest degree, avail us in farthering delivery, and because it has been followed by the most distressing consequences. Thus Chapman* gives an instance, in which the attendant, supposing the child dead, amputated its arm while in utero; it was afterwards born alive, and grew up to manhood.†

While there is a possibility of the infant surviving such serious mutilation, it would be in the highest degree injudicious, not to say criminal, to practice it: but another valid reason would induce us to banish the operation;—that the dismemberment of the child, in the manner described, can seldom be of the least service in facilitating the delivery of the patient; for I have before stated that it is not the arm, partially occupying the vagina, which prevents the entrance of the hand into the womb, but the shoulder impacted in the pelvic brim, and the uterine parietes strongly embracing the child's body. Besides, when the arm has been separated, such a confusion of parts is produced as to render it difficult to discriminate between the fœtal and maternal structures; and should it afterwards be found necessary either to perforate the chest, or separate the head from the trunk, we have lost the means of traction which the arm afforded, and which assists us materially in our operation. For all these reasons, then, the custom of amputating the protruded limb is both unnecessary and unwarrantable.

It may be reasonably anticipated that a transverse position of the fœtus may be complicated with a pelvis distorted to such an extent as to preclude the passage of the hand into the uterus for rectifying its unfortunate situation; or so small as to prevent its extraction, even if the necessary evolution could have been accomplished. In such an extreme case, the Cæsarean section affords the only possible means of delivery.

* Treatise on Midwifery, 1759, p. 113. See also Chamberlen, lib. ii. chap. 12.

† A case of even more aggravated nature occurred in France in the year 1829. A practitioner at Chenu, in the department of Orne, removed both the arms of a child which were protruded together, swollen, and livid, after having made vain attempts to turn: no blood flowed, but the infant was soon born alive; and surviving the mutilations, the wounds speedily healed. The father brought an action against the attendant; and the tribunal, before which the case was tried, referred the matter to the Royal Academy of Medicine for their opinion. A committee of five gentlemen were appointed, consisting of MM. Desormeaux, Gardien, Deneux, Adelon, and Moreau; and they drew up a report, strongly censuring the defendant: but it met with much opposition when discussed in the Academy, and was returned to the committee for consideration. A second time their answer was of the same tenour, though not conveyed in such strong language. Whether any or what punishment was awarded by the tribunal for this malpractice, I am ignorant.—Lancet, April 4th, 1829.)

Order iv.—COMPLEX LABOURS.

Plates XLVII., XLVIII., XLIX., L., LI., LII.

The class complex labours embraces ten orders; not, however, included under one head because of any analogy that they bear to each other, but merely to prevent the embarrassment which might arise from a multiplication of separate and distinct classes.

These are—*first*, labours complicated with hæmorrhage; *secondly*, with convulsions; *thirdly*, with ruptured uterus; *fourthly*, with lacerated vagina; *fifthly*, with ruptured bladder; *sixthly*, with syncope, independently of hæmorrhage, or any extensive laceration or other lesion; *seventhly*, with descent of the funis by the side of the head, or breech; *eighthly*, with the descent of the hand by the head or breech; *ninthly*, labours in which monsters are brought forth; and *tenthly*, in which there is a plurality of children.

1st. LABOURS COMPLICATED WITH HÆMORRHAGE.

Hæmorrhage during labour.—Hæmorrhage is by far the most frequent source of danger to the lying-in woman; and since it is so common in occurrence, so alarming in its nature, and fatal in its effects, this accident calls for the most anxious and serious attention.

It must be borne in mind that all profuse hæmorrhages during parturition, and towards the close of gestation, are to be regarded as originating

in a partial detachment of the placenta from the uterine surface, and the consequent opening of a certain number of vascular orifices. For although some physiologists* have supposed that the vessels which communicate with the decidua might, when a portion of that membrane became loosened from its uterine connexion, furnish a sufficient quantity of blood to constitute an alarming discharge, I cannot think but that they have overrated the consequence of such an accident; and that, during the last few weeks of pregnancy at least, we should attribute all dangerous floodings to a partial separation of the placental mass itself.

It is a common observation, and in a great measure true, that the earlier in gestation hæmorrhage occurs, the less danger does it generally bring with it; so that an attack of flooding coming on, either near the full period of pregnancy, or during the progress of labour, is by far more frequently fatal than in the more early weeks. This is owing to the large quantity of blood that may flow in a short space of time, in consequence of the enormous size which the vessels have acquired towards the close of pregnancy. It has been shown that, as the uterus enlarges in bulk, and its cavity increases in extent, the blood-vessels also undergo a gradual dilatation in their calibre, and that, at the end of gestation, the arteries have acquired a capacity sufficient to admit the barrel of a goose-quill without any difficulty, and the veins a cylinder of even greater diameter.

It must also be noted, that hæmorrhage from the uterus, under labour, is of a passive character; that the blood escapes, not as a consequence of any forcible rupture, produced by the excessive action of the heart and arterial system,—as is generally the case in hæmoptysis,—but merely by being allowed to exude through orifices rendered patulous by the separation of a substance which had previously closed them; and that therefore, when the flow is immoderate, our treatment must necessarily be directed towards preserving within the body as much of the vital fluid as possible.

Although a large loss of blood is always greatly to be dreaded, yet in practice we do not so much regard the quantity that flows, as the effect which the loss produces upon the constitution of the patient; because we find that different women vary very remarkably in their capabilities of bearing up against the results of hæmorrhage. It is surprising to notice how slight a degree of depression will follow an excessive flooding in some women; and how small a discharge will destroy others. I have known two women die from the eruption of scarcely a pint of blood; and I have seen others recover perfectly when they have suffered the loss of some quarts; so that the quantity which would constitute a dangerous

* See Burns's Midwifery, 5th edition, p. 287.

hæmorrhage in one constitution, would in another not even produce alarm.

Besides the quantity of blood lost, the danger to the patient depends also on the celerity with which it flows. If a pint escape at one gush, it is usually followed by a state of faintness, and perhaps complete syncope; but a slow draining may go on for a considerable time, until, in the whole, many pounds may have oozed away, with but little constitutional disturbance; and this difference may depend on two circumstances:—In the first place, the arteries throughout the entire body, by the power of contraction inherent in their structures, accommodate themselves in diameter to the decreased quantity of their contents; and this diminution in calibre they have an opportunity of effecting when the blood drains away slowly, but not when it passes out with greater rapidity:—and secondly, at the same time that the discharge is going on, fresh blood is also formed by the assimilation of nourishment; and thus the deficiency is in part at least supplied, and a more equal balance is kept up.

But although the immediate effect on the constitution is not so great, still we must look with much anxiety on these continual drainings, for they will in time undermine the most robust habit; and I have remarked, that women usually recover better when a small quantity has suddenly broken forth in one eruption, than when they have lost a larger quantity more slowly; although, in the latter case, they may have experienced but little comparative distress at the time the blood was flowing. Dropsies, purgings, affections of the chest, and organic diseases of the abdominal viscera, have more frequently followed a draining continued for a length of time, than one sudden gush, notwithstanding that the violence of the shock in the latter case may have produced a state of syncope that was alarming at the moment. The danger then will partly depend on the quantity lost, partly on the celerity with which it flows; and must be estimated by the effect on the constitution.

When a woman floods in labour, it is very seldom that the discharge will continue with the same impetuosity until death supervenes; but the patient faints and rallies, and faints again: until at length a perfect syncope will paralyze the senses, deaden the nervous energy, and put a stop for ever to the action of the heart. Occasionally, indeed, one tremendous burst takes place, which so completely depresses the system, that a mortal faint at once occurs. The heart and sanguiferous vessels become so rapidly emptied, that they possess no longer the power of contracting upon their diminished contents, so as to propel them onwards; and thus, after making some vain and futile efforts to keep up the circulation, their action entirely ceases, never to be restored;—though this is comparatively rare. Sometimes, again, a slow draining will go on for a length of time,

the faintness increasing with the loss of blood, the heart's action never being perfectly suspended during the continuance of the discharge; and the first attack of syncope will be the last.

Means adopted by nature to arrest hæmorrhage.—Since, then, bleedings seldom continue uninterruptedly until death takes place, it is clear that a process is established by nature for the purpose of subduing hæmorrhage. When an artery is wounded, there are four principal ways by which Nature endeavours to put a stop to the immediate flow of blood; and a fifth, by which she renders the safety of the patient permanent. The first philosophical attempt to explain Nature's mode of proceeding in suppressing hæmorrhage from divided arteries, was given to the world in 1731 by M. Petit,* who accounted for it on the principle of a coagulum formed around, and at the extremity of the bleeding vessel, extending to a considerable distance within the cavity of the canal, lying partly within, and partly externally; and thus offering a barrier to the free flow of blood. This opinion was in a few years commented on by Morand,† who was afterwards followed by Sharp,‡ Kirkland,§ White,‖ Gooch¶, and others. These physiologists, although they in part subscribed to Petit's doctrine, insisted that the chief cause consisted in a change which the artery itself undergoes; that change was severally described as being a corrugation, or plaiting, of the circular fibres of the vessel, by which its calibre is directly diminished, together with a shortening, a corresponding thickening of its longitudinal fibres, and a retraction of the open mouth, which all indirectly assist in contracting its canal. The third opinion was advanced by Pouteau,** who attributed it to the swelling or thickening of the cellular substance surrounding the artery; and lastly, the late Mr. John Bell†† asserts that "when hæmorrhage stops of its own accord, it is neither from the retraction of an artery, nor the constriction of its fibres, nor the formation of clots, but by the cellular substance which surrounds the artery being injected with blood;" and he supposed the pressure thus occasioned to be the cause of the suppression of the bleeding.

More extended observation has taught us that each of these means contributes its due share towards the object which Nature has in view; and we now consider that the flow is temporarily restrained partly by the

* Mem. de l'Acad. Roy. des Sciences.

† Mem. de l'Acad. Roy. de Chirurg., vol. v. 8vo. edit. He refers it to the *crisping* of the vessel, "*crispation du tuyau.*"

‡ Operations in Surgery, 2nd edition, 1739.

§ Treatise on the Method of Suppressing Hæmorrhage from divided Arteries, 1763.

‖ Cases in Surgery, 1770. ¶ Chirurg. Works, 1766.

** Melanges de Chirurg., 1760.

†† Principles of Surgery, 1826, vol. i. p. 250.

extremity of the vessel contracting, partly by its retraction within the surrounding cellular substance, partly by blood effused into that cellular substance, and partly by a conical-shaped clot formed at its extremity, and passing to a considerable distance within its canal. But it must be evident that such slender safeguards, even when acting under the most favourable circumstances, can only exert an influence for a limited time, and that there must be great danger of renewed bleeding on the application of many trifling exciting causes. Nature, then, not content with the insufficient security obtained through these means, has instituted another process, by which the perviousness of the canal is permanently destroyed. The divided extremity of the artery inflames, its *vasa propria* pour out lymph, which, adhering to the internal coat of the vessel, fills up the cavity, and eventually obliterates the canal. Its coats also become thickened by a similar process—namely, a deposition of lymph within their structure; by which two conjoint actions the vessel is converted, in process of time, into a ligamentous cord; and this change is usually observed to have taken place as high as the first lateral branch given off above the seat of injury.

It is an established principle of improved surgery, in cases where an artery is pricked, and cannot be secured to divide it completely across; by which the best chance is afforded it of diminishing its capacity, of burying itself within the surrounding cellular structure, and of becoming plugged at its cut extremity by the formation of a clot.

From observing these wonderful expedients adopted by Nature, and the changes she has instituted, modern art has derived a most valuable lesson; and the surgeon now throws a ligature around the sides of the canal, which at once renders it instantly impervious, in the same manner that Nature attempts through the medium of a coagulum of blood; and the process of adhesion and consolidation afterwards advance in even a more rapidly progressive manner.

To apply this to our present purpose, let us examine if there are any means analogous to those just described, by which Nature or art can restrain hæmorrhage from the uterus under labour. From the small quantity of loose cellular substance which that organ possesses, and the peculiar formation and arrangement of its vessels, we must consider it impossible that they should be able to shorten and bury themselves within the surrounding parts; so that we can hardly expect either *contraction* or *retraction* to assist us in this emergency.

I am not prepared to say that *coagulation* does not occasionally take place at the vascular apertures opened on the separation of the placenta; on the contrary, indeed, I have had frequent proofs that it does, and that

it is some safeguard against the continuance of hæmorrhage;* but still it is a very poor one, and one upon which we are not warranted in relying, provided there are any other means which we can ourselves put in practice. Nor am I exactly prepared to say that *consolidation* of the vessels by coagulating lymph might not perhaps occur; but we should not *à priori* expect it, because the occasion of its deposition, in a divided vessel, is the inflammatory state set up as a consequence of injury. In the separation of the placenta from its uterine attachment, however, there is no solution of the continuity of the vessel itself—there is no injury sustained by it—and we cannot, therefore, with any show of reason, anticipate the occurrence of adhesive inflammation. But even presuming that it was possible for a consolidation of the bleeding vessel to occur to the fullest extent, still the process must occupy a considerable time; Nature cannot effect it at once;—in hæmorrhage under labour, death must occur before even it could be commenced; consequently it cannot be considered as a means of preservation.

But independently of the formation of coagula—independently, if it were even possible, of the consolidation of the trunk of the vessels, and their retraction—Nature arrests uterine hæmorrhage under labour by means as sure, as powerful, as effective, nay, even more so than the silken ligature of the surgeon, and almost analogous to it:—namely, by the contraction of the uterine fibres. The blood-vessels have been described as circulating through the uterus in a most tortuous manner, intersected and surrounded by the uterine fibres in the form of a complicated net-work. When the fibres of the uterus contract, the vessels are closed by the compression; and it is to this admirable contrivance, to this incomparable system of "living ligatures," that all women owe their safety after delivery. This arrangement of Nature possesses a decided advantage over the art of the surgeon; because not only is the trunk of the vessel closed at one point, of a line's breadth, but the compression extends along the the whole of its canal. We must ever bear in mind, that it is to uterine contraction alone we are to look for the ultimate safety of every woman from flooding, after the child's birth: if it were not for this contraction, she must inevitably die.

Symptoms.—The symptoms which accompany uterine hæmorrhage under labour, are those of bleeding in general. The pulse becomes quick, small, feeble, indistinct, and fluttering; the breathing becomes hurried and laboured; the respiration is drawn with sobs and sighs; the voice falters;

* The excess of lymph that exists in the blood of a pregnant woman no doubt tends to favour coagulation.

the countenance is pallid; the lips exsanguined; the eyes glassy and lustreless; the extremities cold; and a cold perspiration breaks out on the neck, face, and forehead. The pulse, by degrees, becomes more feeble and indistinct, and at last fainting supervenes. During the continuance of this faint, the patient remains motionless, and the pulse at the wrist is not to be felt at all perhaps, or at the most is beating very languidly. The heart's action is also enfeebled, or possibly suspended for a few strokes. After an uncertain time, the pulse is again to be felt; the breathing is more natural; the lips and cheeks partially regain their beauteous tinge, and the eye a portion of its fire; the extremities and the general surface become warmer. With a return of animation—with a restoration of arterial action—occurs a return of the bleeding; and the patient rallies, only to contend with fresh and increased dangers. Again the pulse flags; again she sobs and sighs; again there appear the ghastly face and sunken eye; again animation is suspended; and usually the second faint is more intense and longer than before. She may recover a second or a third time, with depressed powers; and now possibly restlessness will take the place of quiet. At first she throws her arms about, tosses off the bed-clothes, cries out for fresh air; and then universal jactitation supervenes. No entreaties, and scarcely force, can restrain her in one position, till again she sinks motionless and faint. On recovering after two or three attacks of fainting, there will probably be rigours throughout the whole frame; vomiting may come on: there is great anxiety of countenance and mind;—she is sure she is dying, calls for her husband and children; and although her fortitude seldom forsakes her, still much dread and solicitude are evident. A sense of constriction of the chest will then appear, as if a cord were tightly drawn around the centre of the body. This suffocating sensation is usually followed by two or three convulsions, and death closes the terrible and agonizing scene.

Although these are the general symptoms, and they mostly occur in the order in which I have enumerated them, it is not necessary that they should all show themselves;—rigours and vomiting, for instance, may be wanting; and the time which may be occupied from the first commencement of fainting till death results, varies exceedingly, according to the constitutional strength and several external circumstances. Sometimes, as before remarked, the first attack of syncope carries off the patient; sometimes there are many faintings; and the vital spirit flutters and hovers around the devoted head, as if unwilling to quit a tenement which it has so long inhabited.

Under such a state of distress and danger, the medical man's duty is indeed of the most arduous and harrowing description; to be of service, he must be prompt, persevering, steady, and decisive; and he must con-

tinue in the use of his means until the total cessation of the respiratory action proves that life is entirely extinct.

Treatment.—In the treatment of hæmorrhage our duty is two-fold: *first*, to restore the patient from the faint into which she has fallen, provided its intensity, or the length of its duration, indicate immediate danger; *secondly*, to prevent a return or increase of the bleeding.

The treatment that we should have recourse to as a general principle, on flooding occurring during labour, is much the same as that we should employ under many of the ordinary states of hæmorrhage. There are particular means, indeed, which are applicable to every particular case, and which I shall hereafter mention, when I come to treat of these cases individually; but I shall now speak of our management generally; and, in the first place, let us give our attention to venesection. It was formerly the practice to consider that all hæmorrhages, except they arose from accident, were to be regarded as of an active character; and, under this impression, venesection was had recourse to, even in flooding under labour, with a view of putting a stop to the discharge. I have already observed, that we look upon it as a passive hæmorrhage; that it is not produced by the increased action of the heart, causing a rupture of the vascular coats, but is occasioned by the blood being allowed to exude through orifices already rendered patulous; and it must be likened in its character to the bleeding from a punctured wound. If a patient were brought to a surgeon with the radial or ulnar artery, or any other large vessel, divided, would any man in his senses think to stop the flow of blood by syncope induced by bleeding at the arm?—Certainly not; he would put a ligature around the vessel, and endeavour to save the patient from a greater loss. In a case of placental presentation, however, before any means were taken to accomplish delivery, I have known the lancet used, in the hope of restraining the hæmorrhage, which very act, in a great degree, diminished the woman's previous chance of life.* I do not mean to assert that in very many cases of hæmorrhage under pregnancy, and especially the early stages, bleeding may not be highly useful; but in labours complicated with flooding, it is scarcely ever—nay, I would say never serviceable. The cautious surgeon would rarely indeed practise bleeding from the arm while the blood is gushing from the uterus during labour.

Secondly, we will consider the propriety of exhibiting opium. Opium is held up by many very great authorities as a most valuable means for

* For cases of placental presentation in which the lancet was used, see Portal's Practice, Obs. 41 and 79; also Smellie's cases, collect. 33, No. 2, cases 13 and 14. Stewart (on Uterine Hæmorrhage, p. 48) recommends bleeding if the patient be plethoric, and not at full time.

arresting hæmorrhage, particularly after the child is born, and the placenta has been expelled. Opium takes off muscular contraction, by destroying nervous sensibility; and it also removes uterine action—the very power on which alone we are to rely for the full and complete closure of the open vessels. Does it not, then, seem preposterous to use those very means for subduing hæmorrhage, which would take away our only source of safety?—Few men, even its most strenuous advocates, recommend it at the commencement of labour, or before the child is born; and hereafter an opportunity will be afforded of canvassing its merits after the birth is perfected.

Thirdly, stimuli. Stimuli are had recourse to for the purpose of rousing the vital energies,—to keep the patient from sinking under the faintness occasioned by the discharge; but their use is dangerous, and they should be avoided, if they can in any way be dispensed with; because, under their operation, the nervous and arterial systems are excited and wound up to a pitch beyond the healthy standard. Thus, as arterial action is increased, the coagulum at the orifices of the vessels, if it have been formed at all, will most likely become dislodged. This plug is to some extent a safeguard, but not one to be depended upon, to the exclusion of other means. It is right, however, to preserve it as long as it answers the purpose of restraining the discharge in any considerable degree. Another reason why we should not unnecessarily have recourse to stimuli is, because it has now become a well-established physiological doctrine,* that the blood coagulates more readily under fainting, than when the circulating system is in full vigour. This is a singular and most beautiful provision of Nature to sustain endangered life: if, then, we remove the fainting by suddenly increasing the arterial powers, we prevent the deposition of coagula, as well as run the risk of forcing away the plug, even when once formed. Cases, however, are unfortunately occasionally met with, in which we must have recourse to stimuli;—where we must rouse the patient from the faint into which she has fallen, lest that particular syncope should prove fatal. We have only the selection of two evils offered us; and we must resort to stimuli, as a matter of necessity, though not of choice. These means, therefore, are never to be employed, except where danger is immediate and imminent.

Fourthly.—Other remedial agents have been used besides stimuli. The ergot of rye has been much extolled for preventing hæmorrhage; and various papers have appeared from the pens of well-informed and unprejudiced men,† intended to prove that it will restrain the flow of blood from

* See Kirkland, Hewson, Jones, Thackrah, &c.

† See the papers by Negri, Medical Gazette, vol. xiii. p. 361, et seq.

other parts of the body as well as the uterine organ. Sufficient trials have not yet been made to enable me to speak positively on the subject, with regard to other organs of the body, but it certainly has the power of restraining bleeding from the womb in many varieties. Where the uterine fibres are too relaxed to produce the contraction requisite for the perfect closure of the vessels, we shall find the ergot of rye a most valuable medicine,—much more so, indeed than opium, whose action is to remove, rather than excite, uterine contraction. The ergot is particularly beneficial in hæmorrhages preceding the birth of the child, and in those after the entire evacuation of the uterine cavity, when it remains in a state of flaccidity,—when the fibres, for want of sufficient tone, refuse to take upon themselves that contraction which is indispensable to the well-doing of the patient.

Fifthly.—Refrigerant medicines, and particularly the mineral acids, are very largely used under uterine bleeding, as well during labour as in the unimpregnated state. Mineral acids it is well known, coagulate albumen; and direct experiments, as well as observations made on patients affected with calculous disorders, prove that they are beyond the influence of the digestive powers, and enter the blood unchanged. It is reasonable to infer, then, that they may, in no slight degree, favour coagulation, and to this quality we may attribute their efficacy in most passive hæmorrhages. In their power of repressing the more violent discharges, indeed, I have but little faith, and would certainly not trust solely to their agency to restrain any copious eruption of blood from the uterus of a parturient woman: but, as they are generally grateful to the patient, and within proper moderation not likely to prove injurious, no objection that I am acquainted with can be urged against their use;—provided too much reliance be not placed upon them, to the exclusion of other more efficient means. The acetate of lead and alum have each of them been much extolled also; and although they may be occasionally had recourse to in uterine hæmorrhage from other causes, they are, in my opinion, inappropriate remedies in those cases of the more copious floodings which we sometimes meet with under labour.

Sixthly.—Cold is also a valuable agent, when applied generally, to overcome faintness, and topically, for the purpose both of moderating the flow of blood to the uterine vessels, and exciting contraction in the uterine fibres; and when combined with astringents, its powers seem to be augmented. In the commencement of the flow, before faintness supervenes, cold may be resorted to almost universally, and without restraint; but its advantage, when the system is much depressed, is more than equivocal: for there is a point beyond which the vital energies cannot bear up against the continued application of cold; and a that point it becomes actually

injurious. Some discrimination is therefore necessary in the use of this common and effective agent.

Seventhly.—Pressure on the uterine tumour by a bandage, or what is better, by the grasp of the hand, is another means of restraining some varieties of flooding, most powerful, daily had recourse to, very generally employed, and open to few or no objections. And the evacuating the uterus artificially is sometimes necessary, though never to be undertaken without grave occasion.

Eighthly.—We have been recommended, and especially by Leroux,* to plug the vagina in all cases of hæmorrhage under labour; but this practice appears to me—except perhaps under placental presentation—likely to be fraught with hazard; for the uterus, at the full period of pregnancy, by reason of its lax condition, allows itself to be easily distended with coagula; and—while its cavity is sufficiently capacious to contain a large quantity—the source of danger is concealed by the blood being pent up within; as, therefore, the nature of the case may thus be overlooked, the peril is likely to be increased. In hæmorrhages under abortion, indeed, when the cavity of the womb is small, and its parietes incapable of distention to any great extent, the *tampon* will often be found invaluable.

Ninthly.—Puncturing the membranes, and letting off the liquor amnii, is often resorted to in accidental hæmorrhage with the most beneficial effects; but this subject requires a deeper consideration than this summary sketch will admit of, and will be considered more at length subsequently.

Tenthly.—The plan of transfusing blood from the system of another person to that of the patient, for the purpose of rousing the dormant powers and of sustaining life under hæmorrhage, has lately been practised in some few cases with success. Dr. Blundell has given us proof that inferior animals can be nourished for a length of time merely by injecting, at proper intervals, into their veins, the healthy blood of an individual of the same species: for he preserved a dog alive for three weeks in this manner without food, merely allowing it a little water; and in that space the animal was reduced but little more than one-fourth of its whole weight.† From this experiment we may conclude, that the same treatment might possibly be found efficacious in the human subject. As a means of preserving life after large losses of blood, then transfusion promises to be in some cases highly useful; and under uterine flooding during parturition, we shall find that its employment is more likely to be benefi-

* Sur les Pertes de Sang., p. 270, &c. † Physiological Researches. p. 75.

cial when the organ is entirely empty and contracted, than at any other period of the labour. In all cases of hæmorrhage perfect quietude both of body and mind, and the horizontal posture, are essential to the well-being of the patient.

Hæmorrhage may occur at any stage of the labour; before the liquor amnii is evacuated; after the membranes have ruptured, and before the head is born; after the head is born, while the shoulders are in the pelvis; between the birth of the child and the expulsion of the placenta; and even after the placenta is expelled, when the uterus is emptied of its previous contents, and when, in the common acceptation of the term, we should consider the labour as concluded.

Hæmorrhage previous to the birth of the child.—To our countryman, the late Dr. Rigby,* we are indebted for a great practical improvement in the treatment of flooding at the commencement of labour. He distinguished hæmorrhage, occurring previously to the birth of the child, into two species—the first of which he called *unavoidable*, and the second *accidental.*

By the first kind—unavoidable—we understand cases in which the placenta offers itself at the os uteri, either blocking up the mouth of the organ, or being partially implanted over it; so that dilatation cannot take place, without *necessarily* separating the placenta more or less from its uterine attachment, and without rendering patulous those orifices which were previously covered and closed by the apposition of the mass.

By accidental hæmorrhage, we mean those cases where the placenta—being attached, not over the os uteri or near it, but in its more natural situation, the fundus or body—becomes, to a greater or less extent, disunited from the uterine surface; but where the separation is perfectly accidental, and where it is not necessary that bleeding should occur upon the opening of the os uteri.

a. UNAVOIDABLE HÆMORRHAGE.

Placental presentations—It has for a long time been known that the placenta may be found at the os uteri under labour; and this malposition was noticed by Guillemeau,† Mauriceau,‡ Amand,§ Astruc,‖ Dionis,¶ in France;

* Treatise on Uterine Hæmorrhage.

† Œuvres Completes, &c., fol. edit., p. 319.

‡ Traité des Maladies de Femmes Grosses, livre 2, chap. 27.

§ Pratique des Accouch., Obs. 20. ‖ Art of Mid., 1767, p. 135, trans.

¶ Treat. on Mid., trans., ch. 24.

Daventer* in Holland; Bracken† and Pugh‡ in this country, besides others; but they all held the opinion, that it was not originally apposed to this part of the uterus by nature, but that, in consequence of some peculiar accidental circumstances, it had become loosened from its attachment above, had fallen down by its own weight, and had thus accidentally placed itself over the uterine orifice. But, inasmuch as not only is the placenta attached to the surface of the uterus, but the chorion is in apposition to that surface throughout the whole extent of the membrane—the decidua, indeed, being interposed—and inasmuch as the membranes are closely united with the placenta, it would follow (provided this idea was correct) either that they must be torn from the placenta all around, or that the whole ovum should partially revolve. We know that neither of these occurrences takes place; and that there is exactly the same arrangement of the vessels of the cervix uteri, and exactly the same kind of connexion between those vessels and the placenta, as obtains between that organ and the vessels of the other parts of the uterus, when it is placed in a more natural and favourable situation.§

Giffard,‖ Levret,¶ and Smellie,** were among the first writers who asserted that the placenta might be placed by nature over the os uteri at its first formation; and the remark has been perfectly borne out by the observation of every practical man since their time.

Under a placental presentation, then, there must necessarily be a greater or less discharge of blood, on the dilatation of the os uteri; and, if the case were left entirely to nature, the bleeding would proceed either as a draining or in gushes, until the successive faintings terminated in a mortal syncope: or—the os uteri dilating rapidly, and the womb acting vigorously—the head of the child bearing forcibly against the placental mass, might expel it first, and itself quickly follow: for it would be impossible

* Art of Mid., trans., 1728, p. 153.

† Treat. on Mid., 1751, p. 132.

‡ Treatise on Mid., 1754, p. 112.

§ See Lond. Med. Gaz., Dec, 1840, p. 462.

‖ Cases by Hody, 1734, pp. 278, 280, 513. Giffard seems to have arrived at a correct knowledge of this position of the placenta by practice and personal observation; for in 1729, (case 84,) giving the history of a case of hæmorrhage before delivery, he says, "No part of the placenta had as yet *sunk down* [to the mouth of the womb] as is customary upon flooding:" while in 1730 (case 115) he makes the following observation—"I cannot implicitly accord to the opinion of most writers, which is, that the placenta always adheres to the fundus uteri; for, in this as well as many former instances, I have good reason to believe that it sometimes adheres to, or near, the os internum, and that the opening of it occasions a separation, and consequently a flooding. See for the same opinion his next case, 116. Heister (Institut. Chirurg., chap. 154, parag. 1,) says some of the moderns consider as a cause of hæmorrhage, the adhesion of the placenta to the mouth of the womb; so that the more the os uteri is dilated, the greater is the separation of the placenta, and the more profuse the flooding.—This work was written in 1739.

¶ L'Art des Accouch., 1761, p. 343.

** Treat. on Mid., 1779, p. 143.

for the child to perforate the placenta, and pass through it; and it would also be unlikely that it should escape by its side, provided the mass were implanted centrally over the uterine mouth. A number of cases are on record in which the placenta was expelled before the child, in the manner I have just mentioned. Smellie has noted three,* La Motte three,† Lee three;‡ my father§ has given three which came under his own observation; and two others communicated to him by friends. Baudelocque,‖ Perfect,¶ Merriman,** Barlow,†† and Collins,‡‡ each mention a case. Hamilton had seen two,§§ I have met with two, and others are scattered through the various periodicals. Although there is thus a possibility of a natural termination of the labour by the placenta passing first, and the child being expelled afterwards, it would be wrong to expect it, or to wait for it; for the probability is, that the woman will bleed to death before the os uteri acquires a diameter sufficient to allow the passage of the child's head through it.

Knowing, then, that in the great majority of instances the patient will die if relief be not afforded, it is considered as an obstetric principle, that, under entire placental presentations, delivery should be effected by art as early as is practicable, without incurring the risk of injury. I shall proceed, therefore, to discuss the symptoms, and the mode of treatment.

Symptoms.—There are some symptoms, which are very suspicious, of placental presentations, and others that assure us of the nature of the case. Those which are suspicious appear at the commencement of labour, and even before the accession of uterine action,—during the last weeks of pregnancy.

We have already learned, that in the first few months of utero-gestation, until, indeed, between the fifth and sixth, the cervix uteri is not developed; it has not yet been expanded, or taken up to form a portion of the general cavity; but when five months are perfected, or about that period, expansion commences, and this unfolding or developing of the fibres must necessarily produce a separation of the placenta from its previous attachment to the upper part of the cervix. This separation must in its turn occasion flooding, even before the process of labour is begun; because the orifices of the vessels previously plugged by the placental mass are opened on its partial dislodgment by the gradual expansion of the uterine

* Collection 18, No. 3, Cases 5, 6, 7.
† Traité des Accouchemens, 1765, Obs. 321, 322, 323.
‡ Medical Gazette, July 13th, 1839.
§ Practical Observations, case 154, and two following.
‖ Vol. ii. p. 37, translation. ¶ Case 109. ** Page 121.
†† Essays, p. 273. ‡‡ Practical Observations, p. 91.
§§ MS. Lectures, 1821.

Fig. 132.



Sinclair's Lith.

neck. We find, then, that during the last few weeks of pregnancy, a patient under placental presentation is liable to sudden gushes of blood, in a greater or less quantity, coming on without any apparent cause,—neither the consequence of exertion, nor accident, nor mental agitation; but when she is asleep in bed,—while she is sitting quiet in her chair,—when unemployed in any active duties,—she is unexpectedly seized with a flow of blood from the vagina. Her attention, perhaps, is scarcely drawn to the occurrence before it has subsided, or diminished to such a degree as to give her but little uneasiness: she will probably suppose that labour is coming on, and she may begin to make preparations for its approach. After the lapse of a few days, another gush takes place as unaccountably, and subsides as suddenly as the former; and attacks of the same kind recur at uncertain intervals during the remainder of her pregnancy.

Whether the patient's mind be impressed with much alarm or not at these repeated bleedings, to one acquainted with the physiology of the placenta, and the peculiar connexion between that organ and the uterus, such a history would be fraught with suspicion and anxiety; and she should be watched over with the most assiduous and solicitous attention.

Our suspicions may also be excited at the beginning of labour, if with every pain,—with every slight increase of dilatation in the os uteri, there be an increase of discharge, and if the flow of blood be moderated or suspended in the interval of action.

But we can only positively assure ourselves of the nature of the case by an examination per vaginam. To this the patient may be unwilling to submit; she may suppose we can be of no service to her, since the pains are so infrequent and trifling. It is our bounden duty to combat her objections, and to insist on the necessity of the measure proposed; since our practice so much depends on the information we gain. The examination will most advantageously be made with the first two fingers of the left hand, because they pass so much higher within the pelvic cavity, and so much more completely command the os uteri. By this inquiry we learn whether the placenta be implanted over the mouth of the womb or not; and if we discover its presence, we must ascertain whether the orifice be entirely or only partially occupied by its mass; for our practice differs much under the two varieties.

Diagnosis.—We shall know the placenta by the fleshy, fibrous, and lobular sensation which it communicates to the finger, and by its being attached to the inner surface of the cervix uteri. Plate XLVII. fig. 132, copied from Hunter, shows the placenta implanted over the uterine mouth. If we can introduce our finger sufficiently far to pass it round within the orifice, we shall be sensible of this attachment, although the union is very easily separated. There is but little chance of mistaking the placenta for

the membranes partially protruded into the vagina; but there is great probability that we may mistake a coagulum, blocking up the os uteri, for the placental mass apposed over it. How, then, shall we discriminate between these two?—The placenta cannot easily be perforated or broken down; the tenacity of a coagulum may without difficulty be destroyed. The placenta is attached within; a coagulum lies loose. The placenta cannot be removed by the finger; but we can generally bring away a coagulum. If there be any doubt, we should take these means—we should try whether it is attached,—whether we can break down its structure, and whether we can remove it from its position; but these attempts must be made with the greatest possible care. The detached surface of the placenta is in these cases often covered by a smooth layer of firm coagulated blood, which being interposed between the finger and the substance of the mass, prevents our feeling the placenta itself; and deception may thus arise.* But a careful attempt to break down the coagulum, or remove it from its situation, has always been sufficient to assure me of the true nature of the case.

Management of placental presentation.—Since, when the placenta is situated over the mouth of the womb, attacks of hæmorrhage generally recur at uncertain intervals during the last few weeks of pregnancy, so it is more than probable that our attendance may be desired on two or three occasions previously to the accession of labour; the patient being suddenly seized with a gush of blood, while in bed perhaps, or otherwise quiet. She will very possibly suppose at first that the membranes have broken, and expect labour to follow rapidly; but, on examining her linen, she becomes sensible that the discharge is blood, and, in a greater or less alarm, summons her medical attendant to her assistance. On his arrival, he will probably find that the flow has ceased, and that she is more composed, though still perhaps a little faint.

Our first endeavour, under such circumstances, should be to calm the mental agitation; and the next, to prevent a return of the bleeding. Should the flow have ceased, and not been profuse, we may with truth and propriety assure her that there is no present danger, and that the prevention of a recurrence will much depend on her own conduct; and we must proceed to lay down, in the strictest manner, rules for her future guidance. As a general principle, bleeding, and the exhibition of digitalis or other depressing agents, are in such a case inadmissible; perfectly so indeed, unless she be plethoric,—unless the arterial system be acting with undue energy, or unless fever be present, or indications of local determination to some particular organ.

* See Ingleby on Uterine Hæmorrhage, p. 142.

Nor shall we find it generally necessary to make a vaginal examination, unless indeed the pains of parturition have already shown themselves; for if the term of pregnancy be distant five or six weeks,—the os uteri being closely shut,—by such an inquiry we should gain no information; we might moreover disturb the coagula formed at the patulous vascular orifices; and thus we should run the risk of causing a renewal of the bleeding. However desirable, then, it might be positively to ascertain whether the placenta were situated over the os uteri or not,—since this knowledge is so difficult to acquire, and since the attempt would most likely augment the danger,—it is better that we should remain satisfied with suspicion, than that we should disturb the temporary safeguard Nature has established; especially as no means can be used except of a palliative nature, so long as the os uteri continues perfectly closed. But, on the other hand, if the flooding be still going on,—if the patient have arrived at the end of gestation, or near it, and particularly if the uterus be contracting at intervals, however weak the pains may be,—we should insist on making an examination per vaginam, and act according to the principles immediately to be laid down. I shall now presume that labour has not commenced, that the term of gestation is not fulfilled, and that the discharge has entirely or nearly subsided on our arrival.

Absolute and uninterrupted quietude in the horizontal posture, and on a hard bed, must be forcibly enjoined, and an anti-hæmorrhagic regimen prescribed; she must breathe a cold atmosphere; be but lightly covered; her diet must principally consist of nutritious fluids—cold and acid drinks may be given almost *ad libitum*, and ices may be allowed, unless they produce intestinal pain or shivering: every thing stimulating, both alcoholic or of any other nature, must be strongly forbidden. The mineral acids, under such a case, may be usefully employed; some gentle aperient will be required, and the acidulated infusion of roses, with small doses of sulphate of magnesia, is perhaps the pleasantest, and at the same time, as efficacious a medicine, as any that can be exhibited. We must avoid a constipated state of bowels; because the straining necessary for the passage of hardened fæces may dislodge the coagula collected over the exposed vessels, and produce a return of the flooding. We must equally, also, avoid violent purging, lest the frequent evacuation of the rectum should occasion a like disaster. A cold enema may be administered daily, which will probably act beneficially in two ways,—both by clearing the rectum, and restraining the hæmorrhagic tendency. Opium may be exhibited if there be present much nervous irritabilty, an excited state of mind, or spasmodic and false pains; but as I have little faith in the power of opium to suppress hæmorrhage, I should not administer it with that specific intention; and I think I have obtained as much advantage from the

pharmacopœial preparations of henbane or hemlock, in quieting an excited state of the nervous system under these circumstances, as from opium itself. Before our departure, we must direct that, on the occasion of another attack, cloths steeped in vinegar and water should be applied to the vulva and lower part of the abdomen, and that we should instantly be made acquainted with the occurrence. It is very possible that we may be called three or four times to the same patient under the same circumstances, and on each occasion may think right to repeat the same cautions and general directions.

But a period will arrive when the features of the case will be changed: when uterine action will supervene, and when the mouth of the womb will begin to dilate, and the hæmorrhage will consequently be increased. It then becomes our duty carefully to consider when delivery shall be effected, under the conviction that it will be ultimately necessary, and that our patient will remain in imminent danger until it is accomplished.

In determining this question, it must be evident that until a certain degree of dilatation is effected, the hand cannot be introduced to accomplish the proposed end; but it is also evident that if we wait until the os uteri is widely open, the probability is, that the patient will be so exhausted as to leave little chance of her survival, even under the most skilful management. The two extremes, therefore, of forcing the hand through the mouth of the womb, while it will not admit of artificial dilatation without sustaining injury, and of delaying our means until the system is depressed beyond the hope of recovery, are both equally to be deprecated in practice; and it becomes a very nice point to fix the exact time when our assistance will be most serviceable.

We may lay it down as an axiom, that as soon as the os uteri is dilated to the diameter of half a crown, the hand may generally be introduced without injury, provided the term of gestation be fully, or nearly completed; and that it would be unwise to wait for its farther development, because we may expect that with the increase of every line's diameter, there will be an increase of the bleeding, and that such a fearful loss will be sustained as will eventually terminate in death. When this specified degree of dilatation is acquired, we are warranted in undertaking delivery; and it is to be accomplished in the following manner. The patient, lying on her left side, is to be brought conveniently near the edge of the bed, and gently restrained by the means I have before mentioned when speaking of transverse presentations. The operator having taken off his coat, and kneeling by the bed-side,—the left hand and arm being greased,—the fingers are to be collected into the form of a cone, slowly insinuated through the external parts, and carried up to the brim of the pelvis, in the direction of the axis of the vagina; with a slow semi-rotatory motion the

os uteri must be carefully dilated, and the hand passed fully into the uterine cavity,—by the side of the placenta,—partially separating that organ from its attachment to the uterine neck. It must be introduced either anteriorly, posteriorly, or laterally, in which ever direction the placenta appears to be thinnest, because the edge of the organ will then most probably be soonest reached, and the uterine vessels will there be found smallest. It is not, however, always easy to distinguish the point at which the placental edge may be arrived at most readily: in this part of the operation, then, we must trust somewhat to accident. Having gained the membranes, they must be punctured, the hand carried into the centre of the ovum, run along the person of the child until the feet be felt; and one or both of these limbs must then be brought down through the rent in the fœtal membranes. The child's body is thus made to revolve on its own axis,—provided the head presents or it lies transversely,—and the breech descends into the pelvis. To facilitate the expulsion, and to ensure ultimately as perfect a contraction of the uterus as possible, gentle friction may be applied over the uterine tumour, through the parietes of the abdomen; and unless the hæmorrhage be continuing profusely, rapid extraction of the child's body should be most cautiously avoided.

When about to perform the operation just described, it must be remembered by the practitioner that his patient's life will depend in a great measure on his own knowledge, presence of mind, and perseverance; and when once he has undertaken the dilatation of the os uteri, he must unflinchingly proceed to the termination of the delivery, unless some extraordinary difficulty should present itself. The hand, then, must be passed slowly and carefully onwards; for to withdraw it would be to risk a renewal or perilous increase of the bleeding.

It might be supposed that the extensive separation of the placenta from its uterine attachment, in the introduction of the hand, as just described, must in all cases produce a frightful augmentation of the hæmorrhage, and that there would be little chance of the patient's survival. This, however, fortunately, is not usually the case. On the first introduction of the fingers through the os uteri, there is certainly almost always a gush of blood, and perhaps to a copious extent; but when the hand has fully entered the orifice, by the pressure it exerts on the open vessels it acts as a plug, and prevents any great additional loss; as it is carried farther, the arm performs the same office; and when the breech of the child is brought into the vagina, or to rest upon the pelvic brim, the body itself causes a like compression: so that if the delivery be skilfully managed, the increase of bleeding which takes place under it is comparatively trifling.

Dreading the fresh accession of discharge which it was thought must necessarily attend the uncovering of so many vascular orifices, by the

hand being slid between the neck of the womb and the placenta apposed over it, some practitioners have recommended that we should perforate the substance of the placenta itself, by working our fingers successively through it.* To me, indeed, this proceeding offers many objections; and the principal consists in the difficulty of its performance. It is by no means an easy matter to perforate the structure of the placenta by the fingers, when the organ is taken out of the body and lying on a table; how much more difficult must it be, then, to run the fingers through it, when it is attached over the os uteri, when there is no resistance behind, to favour our attempt! How much more likely is it that the mass may be lifted entirely away from its connexion with the neck of the womb, and carried up before the hand! And if this should occur, it is reasonable to suppose that the discharge would be much more profuse than if a smaller portion were separated, and the hand slid along between it and the open vessels. It certainly happens occasionally that the placenta is so soft as scarcely to bear being lifted by its edge without falling to pieces; and under such a morbid state the fingers might easily be passed through it; but this is unusual, and our practice must be regulated not by the exceptions, but the general principle. Besides, the aperture made in the placenta by the hand not being larger than the hand itself, sufficient space is not gained to admit the easy passage of the child's body, arms, and head, which must forcibly lacerate the mass as they are being extracted; in such case, not only must the pressure on the funis be great, but there would be danger of the placenta being entirely pulled away from its connexion with the uterus, as the arms were being extracted.

Again, so long as we preserve the placenta entire, we prevent any loss of blood from the fœtal system; but when that organ is torn, the vessels must necessarily be ruptured, and the child, if it be alive, will most probably bleed to death. It is almost incredible how small a loss of blood is sufficient to destroy a newly-born infant. A few drachms oozing from the funis, if the ligature be loosely tied, has been known to cause a fatal result. By perforating the placenta, then, we run a great risk of destroying the fœtus. It may be argued, that the life of the child is not to be brought into competition with the safety of the mother; nor indeed should it; but as I believe there is equal, if not more danger, incurred to the mother by such a mode of action, I would endeavour by all means to preserve the child, provided that were possible. It may be said moreover that in many

* According to Richter, this practice was first introduced by De Leurie and Mohrenheim, (Praxis Medico-Obstetriciæ Mosquæ, 1810, 4to. p. 176.) Smellie, however, (case 8, No. 2, collect. 33,) states that not being able to perforate the membranes, he pushed his fingers through the placenta. In case 14, related to him by a professional friend, the placenta was also perforated.

cases of placental presentation,—if not the majority,—the child is born still; and that therefore the chance of its ultimate survival is but small. This I am willing to grant also; but if the fœtal vessels be preserved entire, its death is caused, not by any loss of blood from the fœtal system itself, but in consequence of its being deprived of the benefits which result from the uterine circulation. During the faint under which the mother lies, the blood is neither sent in the same quantity, nor with the same velocity, to the uterine organ, consequently the changes necessary for the continuance of fœtal life cannot go on in the placenta; the child ceases to exist in consequence of the want of those changes; it dies from asphyxia,—as perfectly suffocated as if it were drowned after the commencement of breathing life.*

But the favourable time for the performance of the operation which I have just noticed may have slipped by before we have an opportunity of seeing the patient; and we may perhaps find her faint, and gasping, and cold; the uterus quite inactive, with its mouth widely open, and possessing that degree of unresisting flabbiness which to an experienced hand, is indicative of the most urgent danger. Under this condition, delivery would indeed be easy, but it would at the same time be followed by almost certain death: for if we empty the uterus under syncope, or deep and long-continued faintness, we cannot reasonably suppose it will take upon itself that degree of active contraction necessary to close its vessels, and place the woman in safety. It would, then, be most injudicious to proceed at once to the operation. Our indication should rather be, to rouse the patient from the torpid state in which she is lying—to bring her system up to a certain point, before we attempt to evacuate the womb. Stimulants here, then, are absolutely called for. Brandy, æther, ammonia, and other cordials, may be exhibited; and transfusion of blood might even be performed, with the view of inducing the temporary excitement so necessary to be procured before delivery be attempted. To the employment of opium under such circumstances, I have objections, on the grounds stated before, although sanctioned by high authority. I cannot agree with Professor Burns† and Dr. Stewart‡ that this drug will check the flow of blood; and I think we possess other cordials and stimulants quite as efficacious in rousing for a time the depressed vital powers, by the exhibition of which

* I would refer the reader to Baudelocque, parag. 985, Dewees, parag. 1152, and Davis, Obst. Med., p. 1045, for arguments against perforating the placenta in this case.

† Fifth edition, page 304.

‡ On Uterine Hæmorrhage, p. 49, he recommends four grains of solid opium, or one hundred drops of laudanum, to be administered before proceeding to delivery; that the dose should be repeated as often as symptoms of irritation occur; and increased according to the urgency of those symptoms.

we do not incur the danger of eventually paralyzing the uterine energies. In most cases we shall find the ergot a serviceable remedy after the stimuli have taken effect, and before the operation is proceeded in. A dose or two of this medicine, indeed, may be given in every instance of placental presentation, previously to the delivery being undertaken, if time admit of its exhibition.

Under the circumstances now treated of especially must we bear in mind, that although it is a maxim in obstetric practice never to allow a woman to die undelivered, if delivery can by any means be accomplished, still it should also be another maxim, never to empty the uterus during the continuance of an attack of syncope; for it is not the mere extraction of the child to which our attention should be directed, but leaving the patient in the most favourable condition, with respect to ultimate recovery, which the nature of the case will admit of.

Again, it is by no means impossible that such alarming symptoms may show themselves before the os uteri has acquired the diameter of half a crown, as to render it extremely hazardous for us to delay our means until that degree of dilatation is arrived at. The blood may be gushing forth in a copious and continued stream, or may be oozing away in a less violent though steady draining; or coagula of considerable size may be passing from the vagina every few minutes: and it must be evident to the least attentive observer that such a state of things cannot be allowed to proceed unchecked. Two modes offer themselves for our choice: either immediate delivery, or endeavouring to restrain the flow, and delaying until the due degree of dilatation is effected. Our practice will mainly be guided by the state of the os uteri itself: if it appear soft, lax, and distensible, offering but little resistance to our fingers in the attempt at dilatation, we shall mostly be able, under the use of sufficient caution, to pass the hand entirely through it without injury, even although its disc be not exceeding the diameter of a shilling; and, indeed, I have accomplished the operation of turning on some few occasions, under these unpromising circumstances, by slowly insinuating the fingers *seriatim*. Although, then, such a proceeding be not desirable, if it can be avoided,—inasmuch as every minute's delay brings with it an augmentation of danger,—we are fully justified in effecting the dilatation of the os uteri thus artificially, even when at the commencement of our efforts, it will scarcely admit the introduction of the tips of the two fingers. For, as a principle, we shall find that delivery had better be had recourse to an hour too soon than an hour too late; and that the frequent fatality of these frightful cases is to be attributed, in a great measure, to the operation having been delayed until the system was irrevocably depressed. The *dilatability* of the organ, then, is to be regarded as an indication

of its capability of being fully opened,—as much as, or even more than, its existing state of actual *dilatation*.

But the hæmorrhage may be profuse, and may threaten immediate dissolution, while the os uteri is dilated to no greater extent than the size of a sixpence possibly, and while it remains in a rigid, unyielding condition; and this is particularly observable when labour has commenced previously to the full term of gestation being completed. It is seldom, certainly, that flooding proceeds to the extent of endangering life, without also causing a relaxed state of the uterine mouth. But occasionally the complication of dangers just adverted to may exist together. Any forcible attempt at opening it artificially would, under such a state, be assuredly productive of injury, probably of a very serious character. As delivery, then, could not be accomplished, except under extreme hazard, no alternative is left us but to endeavour to suspend the flow, and to wait until the mouth of the womb has taken upon itself a more favourable condition. The common principles must here be most assiduously followed; perfect quiet, in the recumbent posture, the application of cold, the removal of every cause of excitement, and the exhibition of cold and acidulated drinks. Local means may also in some degree avail us; the vagina may with advantage be plugged with a silk or cambric handkerchief, or lint steeped in oil, vinegar, or a weak solution of alum; a practice strongly advocated by Leroux;*—inadmissible, however, in any other case of bleeding from the uterus, after four or five months of gestation are completed. Some practitioners,† indeed, of great eminence, object to the employment of this means in any case of labour near the close of pregnancy, fearing an internal accumulation of blood, favoured by the distensibility of the uterine parietes; for, as I have before insisted, the uterus at full time is never perfectly filled by the ovum, but capable of containing a considerable quantity of more matter. Thus, then, although the fluid be prevented draining through the vagina, much may be collected within the cavity of the womb, and a fatal termination may result. This reasoning is undoubtedly true, to its fullest extent, in *accidental* hæmorrhage, before delivery, under retention of the placenta, and in floodings after the

* Sur les Pertes de Sang, p. 238 et seq.

† Merriman (Synopsis, p. 127) says he thinks the plug inapplicable in all cases when the bulk of the uterus exceeds that of a pregnancy of three or four months, or when the parietes are so easy of distention as to yield readily to the accumulation within. Gardien (Traité d'Accouchemens, tom. ii. p. 419) objects to the plug in placental presentations, because it excites the uterus to dilate its orifice, and thus increases the hæmorrhage. Stewart, p. 49, makes the same objection for the same reason. Hamilton also (Pract. Obs., p. 331) condemns it; while Davis, (Obst. Med., p, 1048,(Burns, (fifth edit., p. 302,) and Dewees (parag. 1093, &c.) speak in favour of the means. Astringent injections in these more formidable cases of hæmorrhage are of no benefit, and they may be injurious by washing away coagula.

expulsion of that organ; nay, as the blood concretes in the uterine cavity, the viscus is more and more distended; its vessels become gradually more and more dilated: their orifices gape wider and wider, and consequently they are rendered capable of pouring out a larger quantity of blood in a given space of time. Thus, then, the insertion of the plug would be adding, in a geometrically increasing ratio, to the peril of the case. Nor must another cause of additional hazard be overlooked: the external flow of blood being prevented, the source of danger is concealed, and it is possible for fatal deception to arise. But when the placenta is implanted over the os uteri, it is, in my opinion, unlikely that blood will be poured out into the womb itself; and if the vagina be perfectly filled with the *tampon*, there is no other cavity in which the vital fluid can collect; so that I think we may occasionally have recourse to it with advantage. Blood is certainly less likely to accumulate at the cervix uteri than towards the upper part of the organ; and such a collection near the orifice as to endanger life can only, in my judgment, occur under a state of great laxity of uterine fibre, and extreme depression of the vital energies.

Another objection which has been raised to the use of the plug in these cases, consists in the necessity of removing it whenever a vaginal examination is required to be instituted, for the purpose of watching the dilating process going on in the os uteri: but the frequency of return, and the strength of the uterine contractions, will in some measure indicate to us the changes taking place in that organ; and we must be guided by those indications in regard to the removal of the plug,—provided it stanches the flow outwardly, and provided also there are no evidences of internal hæmorrhage. Although, then, I consider the *tampon* may be occasionally useful, I am far from recommending it in preference to other means; and I think it should only be resorted to in the rigid, unyielding condition of the os uteri just mentioned, when the discharge is alarming, and can be restrained in no other way, and when an attempt at delivery would endanger the structure of the organ.*

I have given the student to understand that placental presentations are always fraught with extreme peril; I look upon them, indeed, as the most dangerous of all cases of hæmorrhage; and many causes contribute their

* Many cases have come under my notice, where plugging the vagina under placental presentations has restrained the flow of blood for a time. And should the attendant be diffident in his own opinion, and anxious to obtain the counsel of a friend, he may with great propriety have recourse to this measure in the interval that must elapse before assistance can arrive. But I would strongly advise every well-educated surgeon, if the bleeding be profuse and the os uteri lax and dilatable, rather to undertake the delivery himself, and alone, than send to any great distance for aid; because every hour's not to say minute's delay, under such circumstances, increases the hazard of his patient; and because the delivery in itself is not very difficult.

share towards the productionof this danger. The frequent losses of blood which occur previously to the accession of labour, tend, in no small degree, to depress the constitution, and render it unable to sustain the aggravated shock occasioned by the unusual discharge on the opening of ths os uteri. The violent gushes which generally accompany the dilatation of the womb, and the natural and praiseworthy reluctance which most practitioners feel to a *forced* delivery when the os uteri is in an undilated state, (and this very feeling may induce delay beyond the period of safety—of which I have myself known instances,) all combine to render this, indeed, a fearful case. But it appears to me that still another must be added: I mean, the sudden emptying of the uterus of the *whole* of its contents comparatively rapidly; and that too at a time when the constitution, weakened by hæmorrhage, is easily affected by any depressing action. We well know the effect of suddenly evacuating the water in ascites; we know that the most courageous and hardiest persons will sometimes fall into a state of syncope, even under the comparatively trifling operation of tapping; and we account for the faintness by the rapid removal of that pressure from the large vessels of the trunk—and perhaps from the viscera themselves—to which they had been for so long accustomed. It appears to me that the same circumstances obtain in delivery under placental presentation, as commonly practised. The gravid uterus occupies a very large space in the abdominal cavity; during its gradual increase, it has been exerting a constantly augmenting pressure on all the parts surrounding it; these parts accommodating themselves to the inconvenience they must necessarily suffer during pregnancy, by the slowness of the organ's development. But when its contents are suddenly removed—when the liquor amnii is allowed to escape, and with it the fœtus is extracted also—an enormous decrease in its bulk is effected, considerable pressure is at once taken off,—and that, too, at a time when the system is suffering much from previous depressing causes—and we cannot wonder that collapse occurs as a consequence; even should the delivery have been perfected with but slight additional loss of blood. It has occurred, therefore, to my father,* (and in his sentiments I fully join,) that in some aggravated cases it might be desirable partially to evacuate the uterus, and wait for a short period, before completing the delivery, provided this could be done without inducing a farther separation of the placenta; and the discharge of the liquor amnii seems to offer us a means of accomplishing this end. For this purpose, however, the placenta must be perforated by some sharp instrument —a common trochar for instance; and a probability therefore exists, that fœtal blood may be lost by the laceration of one or more placental vessels. Such a chance of injury we cannot guard against; and as this mode of

* Practical Observations, part ii. p. 189.

proceeding would only be advisable when the woman is very much depressed, and when, as a consequence, the child would have almost invariably perished, the chance of its being born alive ought scarcely to influence practice. I have never myself resorted to this expedient, but it is suggested on the principle of emptying the uterus as slowly as possible, by which both the pressure is removed more gradually, and also a better opportunity is afforded the viscus of taking on itself expulsive action.

It is more than probable that spirituous stimuli may be required during the process of extraction, as well as after the completion of the birth. Since, however, their exhibition is such a nice point, it must be regulated by the extremest caution.

Partial placental presentation.—As there is no part of the internal surface of the uterus to which the placenta may not be occasionally attached, so we find it sometimes *partially* placed over the orifice at the beginning of labour; one-third, half, or two-thirds of the disc of the os uteri being covered by the placenta, and the remainder occupied by the membranes; and partial placental presentations are more frequently met with than cases in which the mass is centrally implanted over it.

Under this state of things there will exist the same liability to hæmorrhage during the development of the cervix uteri, as in the case just described; —the same symptoms, therefore, during the last months of pregnancy —the same sudden and occasional floodings, not to be accounted for by any apparent external cause—the same spontaneous cessation. On the accession of labour-pains also, the symptoms will be equally similar: we shall observe the same increase of discharge on the return of each pain, and the same diminution or subsidence in the interval of action; but the probability is, that the hæmorrhage will not be so profuse because we may calculate on the vessels that are opened being both fewer in number and smaller in calibre.

Diagnosis.—Although so similar in character and symptoms to the case last spoken of, partial placental presentations are by no means so hazardous; and they admit of a somewhat modified treatment. They can only be discriminated by a careful vaginal examination. On introducing the finger for this purpose, the edge of the placenta may be clearly felt, and the membranes passing off from it; a portion of the fleshy mass, thin and moveable, can also be distinguished, closing a part of the uterine mouth; while the remainder of the orifice is occupied by the membranes, through which the presenting part of the child may, perhaps, be perceptibly discerned.

It is very possible, if the os uteri be much dilated, that a considerable portion of the placenta may be propelled downwards into the vagina, ap-

Fig. 133.

Pl. XLVIII.

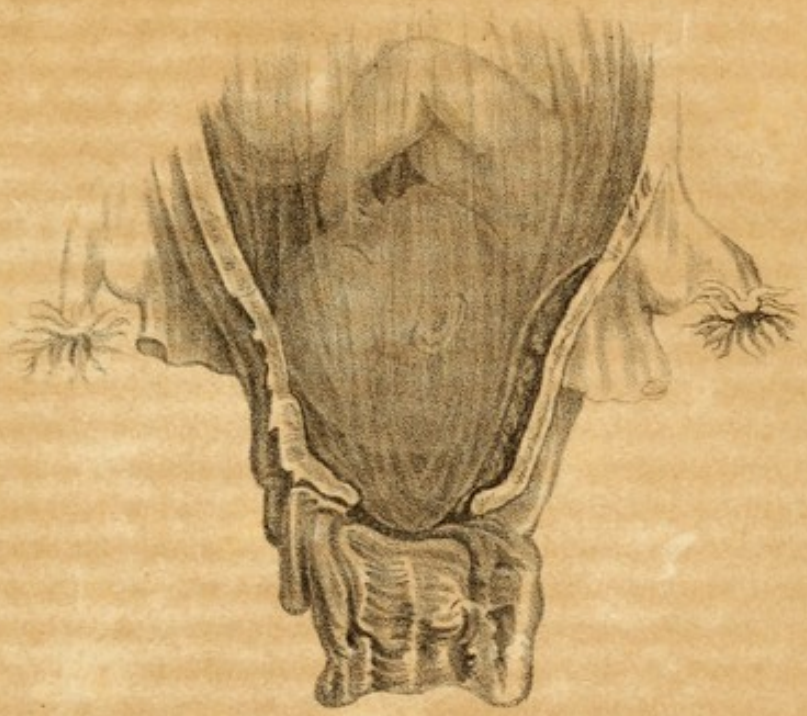
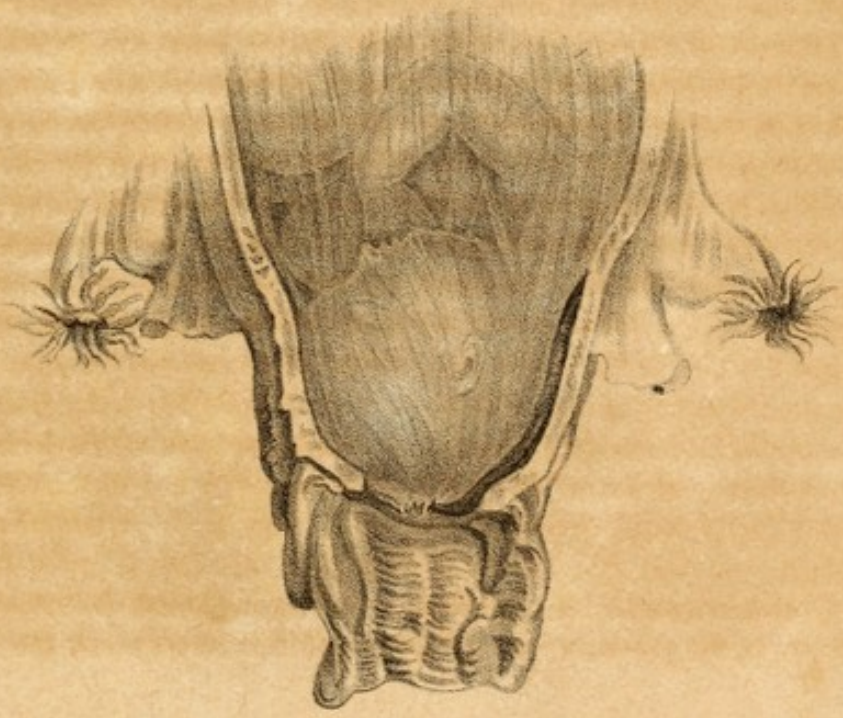


Fig. 134.



Sinclair's Lith.

parently hanging loose in that cavity, but still connected within to the cervix uteri above. The danger will generally be proportioned to the quantity of the organ implanted over the uterine mouth; and the profuseness of the discharge will be principally regulated by the degree of separation.

Treatment.—Previously to the dilatation of the os uteri, our general management must be precisely similar to that already advised; but when labour is established, it must entirely depend on the state of the patient herself, and the urgency of the symptoms. Should the sanguineous appearance be but trifling,—which, however, is not often the case,—the labour may perhaps be allowed to proceed uninterfered with; but should a continued discharge be going on, it will be most prudent to rupture the membranes, and allow the liquor amnii to drain away; and this may with advantage be done, whatever degree of dilatation the os uteri may have acquired, and whatever degree of depression the patient's system may have suffered, provided the head present, or indeed the breech, or any part of the inferior extremities. Nor will this be found difficult to effect—either the finger-nail, the stilette of a catheter, or a pointed quill, being quite sufficient for the purpose. If the os uteri be covered but in a trifling degree by the placental mass, the best opportunity is afforded of compressing the vessels previously opened, by the descent of the head upon the pelvic brim, and of increasing the expulsive efforts of the uterus by the augmented stimulus propagated to its mouth. And if the placental attachment be more considerable, and the flooding consequently more copious, so that artificial delivery subsequently becomes necessary, the uterus is relieved of a part of its contents before the operation is commenced, and no small degree of the danger necessarily attendant upon the case thereby averted. Another desirable effect is produced by the diminution in the capacity of the uterine vessels in consequence of the partial contraction of the parietes; and a third by the probability of a farther separation of the placenta to any great extent being much lessened; for so long as the membranes are entire, it stands to reason that the placenta is likely to be detached in the same proportion as they are protruded downwards into the vagina; but when the bag is destroyed, and the head presses with some power against the mouth of the womb, the chance of an increased separation is materially diminished, as well as a plug formed by the compression which the head occasions. Plate XLVIII. fig. 133, shows the placenta partially attached over the uterine mouth, the membranes being still entire: fig. 134 the same case after the water has been evacuated. It will be seen that the head, by pressing the placenta, forms a plug, which is likely to prevent any farther loss of blood; while, by stimulating the os uteri by the same pressure, it may and probably will occasion a more

rapid dilatation of that organ. The ergot may be usefully exhibited after the membranes are broken.

Nevertheless, it must not be supposed that a natural termination, though so highly desirable, will invariably follow the proceeding I have recommended: the after conduct of the case, then, must depend on the continuance of the hæmorrhage, and the effect produced on the constitution. If the flooding be at once stayed, and the patient not much depressed, our indication would evidently be to allow Nature an opportunity of perfecting the delivery unaided. Even if a slight oozing continued,—provided the uterus was acting with vigour,—the labour progressing, and the powers of life remained tolerably good,—it would be injudicious to interfere, because so much less danger attends a natural than an artificial birth. But should the constitution become gradually weakened, should the pulse flag, and faintness occur, we must resort to manual delivery; and we shall find the operation of turning usually most applicable to the case.

From the acknowledged probability that delivery may in the end be requisite, an objection has been strongly urged against this plan, under the impression, that, after the escape of the liquor amnii, the uterus may so powerfully compress the fœtal body as to prevent the introduction of the hand for the accomplishment of the operation of turning. I have already laid it down as a principle, that under transverse presentations the passage of the hand and version of the fœtus is comparatively easy while the membranes are preserved whole, but that it becomes an operation of the utmost difficulty when the fœtal body is closely embraced by the uterine parietes. It has been supposed that the same difficulty would be met with under the circumstances I have just described. Such reasoning, however, is founded on false data, and is in itself, therefore, untenable; for should the uterus act with sufficient energy to oppose a serious obstacle to the introduction of the hand, its contraction will be vigorous enough to propel the head so forcibly against the os uteri as to check the discharge by its own pressure, and eventually to expel the child,—provided, indeed, the pelvis be of ordinary capacity, and the soft parts have acquired their usual distensibility. When the fœtus lies transversely, it cannot pass by the agency of nature alone, because of its unfavourable position; but if the vertex offers itself under a partial presentation of the placenta, such an impediment cannot exist.

After having punctured the membranes, then, the patient still requires careful and constant watching; and we must be prepared to act with promptitude should circumstances require our farther interference.*

* Of partial presentation of the placenta, or its implantation on the neck of the womb, close to the os uteri, within reach of the finger under examination, it has fallen to my lot to see numerous cases. I have the detailed histories of forty-four occurring between 1823 and 1834;

b. ACCIDENTAL HÆMORRHAGE.

The second variety of hæmorrhage before delivery depends on a partial separation of the placenta from its attachment to the body or fundus of the uterus: and as it is evident that, unless the mass be situated over or near to the os uteri, flooding need not *necessarily* accompany the dilatation of the orifice, so it is equally plain that the discharge in the case under consideration must be regarded as purely of an *accidental* nature.

It is probable that before the termination of gestation one or more attacks of hæmorrhage may appear; and that the first may be traced to a blow or a fall, sudden or unusual exertion, or violent mental agitation: but in general it does not show itself till the beginning of labour, and may, perhaps, be referred to undue and irregular action of the uterine fibres, at that particular part against which the organ is apposed. It it mostly observed in accidental hæmorrhage, that, after the establishment of labour, the discharge is diminished in quantity, or wholly suspended, while the uterus is contracting; and returns more copiously in the intervals of action.* In both these respects the suspicious symptoms differ materially from those which would lead us to believe that the placenta was implanted over the os uteri; for I have stated that when it offers itself before the child, as the uterine neck expands by a gradual growth—the fibres dilating circularly from above—its surface slips away from its connexion with the placenta. I have shown that this separation is almost always attended by discharges of blood at uncertain intervals during the last few weeks of pregnancy, coming on without any assignable cause;

all of which I have personally attended. It is curious that of these forty-four, in six the fœtus offered itself at the os uteri with the breech, and in five transversely. In most of these cases, however, labour came on prematurely; but I have remarked also, that under complete placental presentations, a preternatural position of the fœtus is more frequent than ordinary. In forty the membranes were ruptured some time before delivery was proceeded in; in thirteen of these the labour was terminated by the agency of the natural powers alone; in twenty-six, turning was accomplished, and that without much difficulty, the discharge not ceasing on the evacuation of the liquor amnii, but in the great majority being most materially lessened; and one was terminated by the forceps. In three of the transverse cases the operation was undertaken immediately. Eight of these patients died; one from malignant puerperal fever, which was raging at the time; another from an inflammatory attack ten days after delivery; two in whom the placenta was strongly adherent to the cervix uteri, giving much trouble in its separation; and the remainder apparently from the excessive loss of blood suffered previously to delivery being effected: one of the cases in which the child lay transversely was among these latter.

* This is easily explained by the pressure which the parietes of the gravid uterus exert on the ovum during contraction, and the temporary plug consequently created at the open orifices of the uterine vessels.

that on the accession of labour also, with each contraction there is usually an increase of the bleeding, and a diminution when the pain declines.

Although of a character to excite considerable anxiety, this case is very much inferior in danger to placental presentations, either partial or entire. The diagnosis from placental presentation is not difficult; it is known by the membranes being discernible, protruding more or less through the os uteri, and the placenta being completely out of the reach of the finger: it remains that we should consider the

Treatment.—On this subject there still prevails a diversity of opinion among practical men, though the great majority strongly recommend the adoption of the plan I myself pursue,—an early rupture of the membranous cyst. This simple proceeding I have almost invariably found subdue the discharge, in the case under consideration, even more completely than when the placenta was partially implanted over the uterine orifice; and, as far as my observation has gone, it has been attended with the happiest results.

Before the commencement of labour, indeed, the general treatment already recommended may be enjoined; and it will frequently be found that the discharge is arrested by a rigid adherence to the anti-hæmorrhagic system: but when the flooding continues while the os uteri is dilating, other means must be had recourse to beyond those of a mere palliative kind; and the evacuation of the liquor amnii, on the one hand, and immediate delivery on the other, have each, even in the present day, their advocates.*

The great advantage resulting from letting off the waters of the ovum have already been noticed, when partial placenta-presentations were under discussion. The vessels of the uterus are diminished in size by the

* Till within the last few years no part of obstetric practice was founded on more uncertain principles than the treatment of hæmorrhages before delivery,—some authorities advising the case to be left to the agency of Nature alone, others to puncture the membranes, and others again contending for immediate delivery in every instance,—but all agreeing that when the hæmorrhage is profuse, and the patient's life is placed in imminent hazard, emptying the uterus artificially offers the only chance of safety. And this discrepancy of opinion and advice evidently arose from the true nature of the different causes of the discharge not being well understood. Since the excellent treatise of Rigby, however, has become so generally known to the profession, not only is the obscurity in which these cases were shrouded removed, but a fixed and determined principle of practice is established for our guidance.

Guillemeau, the celebrated pupil of the still more celebrated Paré, following the suggestions of his preceptor, advised delivery by the feet in all cases of dangerous hæmorrhage; and this method was almost universally adopted till the time of Julian Clement, who insisted on the more simple plan of rupturing the membranes: and to Puzos, the pupil of Clement, the credit is due of first publicly advocating this practice. Still, however, as little or no distinction was drawn between those cases in which the placenta presented first, and hæmorrhages of a purely accidental nature, the practice could not be considered as based on scientific or sure grounds, until Rigby, with the most praiseworthy zeal, directed his observant mind to the subject.

contraction of the uterine fibres;—the open orifices are in a degree plugged by the parietes being brought into closer and stronger contact with that portion of the placental mass disunited from the uterine surface; and the pains are usually increased in frequency and power by the augmented stimulus impressed upon the os uteri.*

Nevertheless the utility, as well as the propriety of rupturing the membranes in accidental hæmorrhage is denied by Hamilton,† Burns,‡ Stewart,§ and some other practitioners. Three great objections have been taken to the practice:‖—first, that gestation is necessarily suspended by the evacuation of the waters of the ovum;—secondly, that the time is uncertain at which delivery will be perfected after the operation,—during which interval the dangerous symptoms may be much aggravated;—and, thirdly, that as puncturing the membranes will not always suspend the flow of blood, should delivery become requisite, its performance will be rendered extremely difficult, in consequence of the powerful contraction of the uterine parietes around the fœtal body. To the first objection the answer is easy and conclusive; for, since we may presume that labour has already commenced by the dilatation of the uterine mouth, the process of gestation must have been arrested before the operation is resorted to. Even should the term of pregnancy be distant,—inasmuch as large losses of blood usually excite uterine action, and we may therefore presume that a premature expulsion of the ovum will ensue,—puncturing the membranes can but hasten the event; it does not originate the disposition. Besides, should the woman's life be endangered by the profuseness of the discharge,—since the probability is that the complete evacuation of the uterine cavity will alone place her in a state of safety,—the preservation of an immature fœtus cannot be put into competition with the chance of recovery afforded her. The uncertainty of time at which effective uterine

* This measure is sanctioned by the authority of Denman, Baudelocque, Merriman, Blundell, my father, and many other men of acknowledged practical experience. Rigby has reported a great number of cases in which the rupture of the membranes entirely put a stop to the previous discharge,—and he states that he never had occasion to turn the child in any instance where this expedient was resorted to. Merriman (Synop., p. 119) mentions that he has adopted the same means in upwards of thirty cases of accidental hæmorrhage; "that as yet he has had no reason to be dissatisfied with the plan, for in every instance the discharge has either entirely ceased, or been so much diminished as to secure the safety of the patient; and yet there were some among these patients whose cases, from profuse hæmorrhage, were abundantly alarming." In my own practice, out of twenty five successive cases of this kind, of very aggravated nature, occurring within the space of eleven years in twenty-three instances the labour was terminated naturally and safely after the rupture of the membranes, and in two the loss of blood had been so profuse, before I saw the patients, as to induce me to deliver artificially; in both instances, with a fatal result.

† Pract. Obs., 1840, p. 331. ‡ Princip. of Mid., 5th edit., p. 318.

§ On Uterine Hæmorrhage, p. 92, &c.

‖ See Dewees, parag. 1051 et seq. He only admits puncturing the membranes to be safe when the os uteri is dilated or dilatable.

action will be established, has been adduced as another serious objection; and this appears to me as untenable as the former: for in my own practice I have usually found the contractions speedily increased, both in frequency and strength, after the measure has been resorted to; and the same observation must be made of a perusal of the cases detailed by Rigby. The third objection, at first sight, would seem the most plausible; but I have already replied to it by observing, that if the uterus contracts powerfully enough to refuse admittance to the hand, its action will be sufficient to expel the fœtus, or at least so to compress the open vessels as to put a stop to any farther flow of blood in an immoderate degree. But if confirmation were required, I might with confidence advert to the experience of Rigby, Merriman, my father's and my own, in corroboration of the statements which I have just advanced.

For reasons before given, I consider it my duty strongly to recommend this practice in preference to immediate delivery: for my opinion is perfectly at variance with Professor Burns,* who asserts that experience has taught us puncturing the membranes cannot be relied on. On the contrary, we may affirm that experience taught Smellie,† Denman,‡ Rigby,§ Merriman,‖ Blundell,¶ Davis,** Conquest,†† Ingleby,‡‡ and many other eminent men, not only of this country but on the continent also, that this easy and gentle expedient could be trusted in the great majority of instances; and personal observation has long impressed me with the conviction of its high value. Nor am I more disposed to agree with the Professor in his eulogium on the use of the plug,§§ in cases where rigidity of the os uteri precludes the possibility of immediate delivery, although sanctioned by the authority of Dewees,‖‖ Capuron,¶¶ Gardien,*** and Dugés;††† because, notwithstanding the blood may be prevented flowing externally, it may still collect in such quantities in utero as to destroy life.‡‡‡ If such be the case, then, the *tampon* must prove a dangerous application, and should not supersede the rupture of the membranes. It is certainly possi-

* Principles of Mid., 5th edit., p. 318.

† Vol. i. chap. iii. sect. 3; see also vol. ii. p. 268, and vol. iii. p. 113.

‡ Chap. xv. sect. 7.

§ On Uterine Hæmorrhage, 4th edit., p. 31.

‖ Synopsis, p. 118.

¶ Obstetricy, by Castle, p. 454.

** Obstetric Med., 1053.

†† Outlines of Mid., p. 157.

‡‡ On Uterine Hæmorrhage, p. 125.

§§ Op. Cit., p. 302.

‖‖ Parag. 610 and 1027.

¶¶ L'Art des Accouchemens, p. 391.

*** Traité d'Accouchemens, vol. ii., p. 414.

††† Man. d'Obstetr., deuxième édit., p. 230.

‡‡‡ The practitioners, indeed, whose names I have quoted in the text, deny the possibility of such an occurrence, while those of our own country (particularly Hunter, Denman, Barlow, and Merriman) look upon the uterus, at the termination of pregnancy, as capable of containing a body much larger than the ovum, and fear an internal accumulation of blood in consequence of its distensibility. Of this fact, indeed, more than one instance has come within my own knowledge.

ble that completely filling the vagina may be advantageous in cases where the membranes have been broken, where the os uteri continues rigid and undilated, and where any attempt at delivery must be attended with danger to its structure; but such cases, at the full period of pregnancy, according to my own experience, I should look upon as of very rare occurrence indeed.

After the evacuation of the liquor amnii, it may be serviceable to administer the ergot—unless, indeed, the mouth of the womb be preternaturally rigid: stimuli may be required if the patient be much depressed; but opium, for the reasons more than once adduced, I should avoid. Friction, and moderate pressure on the uterine tumour, may have the effect of exciting increased action, and the dilatation of the os uteri may be forwarded by the fingers introduced carefully within it during a pain—a means recommended by many practitioners, but one which I have myself seldom found it necessary to employ.

Should the discharge continue to flow outwardly with profuseness, or should indications of internal bleeding be present—the symptoms, indeed, being those of loss of blood generally, together with a flabby and relaxed state of the uterine parietes—delivery must be had recourse to without delay, as offering the only reasonable chance of safety.*

Placental presentation complicated with transverse position of the fœtus, or small pelvis.—It must be evident that when the placenta is situated either entirely or partially over the os uteri, the child may present with the breech or transversely. Under an *entire* placental presentation, such a preternatural position of the fœtus would not influence our practice; because delivery would be required, not in consequence of the mode in which the child lay in utero, but because of the unfortunate misplacement of the placenta itself;—and, indeed, it is more than probable that its position would not be detected until the hand was introduced into the uterine cavity: under either case, extraction must be made by the feet. Should the placenta, however, be but *partially* occupying the orifice, while the breech is at the brim, the membranes may be ruptured and time allowed for its descent, provided the flooding be restrained. But, on the other hand, if the child lie across the pelvic brim, it would be better to undertake the delivery at once—to treat the case, indeed, as a transverse presentation—proceeding with extraction as slowly as is consistent with the safety of the infant.

* On the subject of hæmorrhage before delivery, I would strongly recommend the student to peruse with attention Rigby's Essay, already alluded to, as well as the much more recent treatise by Ingleby; which latter I look upon as one of the most practically useful productions of the day in our department of medicine; and with most of the observations contained in which I perfectly coincide.

A placental presentation may also be complicated with a distorted pelvis; so that, though we may have turned the fœtus and brought down the breech and body, we may be unable to extract the head. Under such circumstances, the cranium must be perforated in the manner before explained.* This is a complication which seldom occurs, but it has happened to me to meet with three such cases, and very embarrassing I found them. Much time must be occupied in the delivery, and it might be imagined that during it the hæmorrhage would be profuse: such, however, fortunately was not the case in either of the instances I attended. In all, the head was perforated behind the ear; and the delivery was accomplished with less difficulty than I expected.

Our first duty, then, in floodings before delivery, consists in ascertaining whether the placenta presents over the os uteri; and if so, whether the orifice be wholly or partially occupied by it. If it be found entirely covering the mouth of the womb, we must turn the child as soon as that organ is dilated to the size of half a crown, or even before, should it be sufficiently relaxed and the flooding continue violent; if partially, we may rupture the membranes—provided the head present—and hold ourselves in readiness to deliver by turning, expecting that probably the flooding, although it may abate, will not quite cease. If no part of the placenta be discoverable by the finger, we may rupture the membranes as early as possible, and hope by this means to put a stop to the hæmorrhage; but at the same time we must be prepared to turn, in case our expectations are disappointed. We may exhibit the ergot of rye in most cases; give stimuli if they be required; and should the os uteri be rigid and undilated under placental presentation, either entire or partial, or under accidental hæmorrhage after the membranes are broken, we may perhaps venture to plug the vagina; but if we do this, we must keep a close watch on our patient, less internal flooding be going on.†

Hæmorrhage subsequent to the rupture of the membranes.—A large loss of blood seldom occurs after the membranes have ruptured before the birth of the head, unless there have been hæmorrhage previously; but if a discharge should appear to such a degree as to call for our interference,

* Page 298.

† Peu, (Pratique des Accouchemens, 1694, p. 454,) La Motte, (Obs. 249,) Levret, (Accouchemens Laborieux, 1770, p. 205,) and Baudelocque, (parag. 1084, trans.,) cite instances in which it was supposed that a rupture of the umbilical cord produced hæmorrhage after the membranes had broken; but in this case we should not expect the flow to be profuse, and as the blood lost would be entirely fœtal, no effect would be produced on the mother's system. This is a very rare complication of labour; and the belief in the possibility of its occurrence ought not to influence our practice one way or other.

delivery must be resorted to—by turning, if the head be above the brim of the pelvis, and the os uteri not thoroughly dilated—by the long forceps, if the head have entered the pelvis too low to allow of our raising it for the introduction of the hand into the uterus, but not low enough to enable us to feel an ear—and by the short forceps, or the vectis, if one or both ears be distinctly within reach of the finger. One or other of these methods will generally be found adequate to the end; but should there exist a small pelvis, tumours or preternatural rigidity of the soft parts, we may be obliged to perforate the head.

It sometimes happens, that after the head is born, a considerable time elapses before the uterus again acts to expel the shoulders and body; and during this interval, flooding may come on. In such a case, we may endeavour to stimulate the organ to increased energy by pressure and friction, and the exhibition of the ergot; and we may expedite the delivery by gentle and careful traction, in the hope that the uterus will, as it were, follow the body of the child during its extraction, separate and throw off the placenta, and eventually close its cavity and seal its vessels.

Hæmorrhage after the birth of the child.—Hæmorrhage under labour by far the most frequently occurs after the birth of the child, and previously to the expulsion of the placenta; and the flow is often most sudden, rapid, and profuse. At the very time, probably, when the husband and friends are congratulating themselves on what they consider the fortunate termination of the case, and when the medical attendant is joining in those congratulations, danger is insidiously hovering around, and death is sometimes rapidly, though secretly, approaching.

Flooding after the child's birth is dependent on the same general causes as before its expulsion namely, the separation of the placenta, more or less, from its uterine attachment, and the womb not being capable of contracting its cavity so as to render its vessels comparatively impervious. We know that unless the uterine cavity be empty, its perfect contraction is prevented, and consequently the complete closure of the vessels is impeded; and that so long there is a great probability, nay, almost a certainty, of hæmorrhage occurring. If, then, the placenta be partially or wholly retained in the uterus, and a portion of it be separated from its attachment, the vessels must continue open, and the woman must therefore sustain more or less discharge.

There is always, as I before mentioned, (p. 116) a certain amount of blood lost upon the separation of the placenta and its protrusion; usually not exceeding a few ounces: and this seems to consist of little more than that quantity which was contained within the uterine vessels, and which is squeezed

out mechanically, through their open orifices, by the contraction of the uterine fibres; so that scarce any is lost to the system generally. But when the discharge is copious, all the vessels of the body are proportionably emptied; and from the rapidity with which the blood flows, we cannot wonder at the instantaneous depression which sometimes follows.

It has been advised, (p. 137) that immediately after the child is separated, and transferred to the care of an attendant, the right hand should be placed between the thighs of the patient, upon the abdomen, to ascertain the state of the uterus, with regard to the degree of contraction it has taken on itself, and whether or not the placenta has passed from its cavity; and I have mentioned that there are five conditions in which it may be found differing essentially one from the other, and each indicating a state of greater or less security.

After having made this external examination, I have also directed that the first finger of the right hand should be passed into the vagina, to examine for the placenta before the bed-side of the patient is left. I have stated that we may feel tolerably well persuaded the placenta is in the uterine cavity, if that organ be found large externally, but that we become positively certain, if, on running the finger along the funis umbilicalis up to the pelvic brim, we cannot detect the mass; because, if it be lodging in the vagina, it would be within our easy reach.

The reader will find at pages 141–2 a caution against any attempt to remove the placenta from the *cavity of the uterus* by traction at the funis umbilicalis. Such an attempt I look upon as dangerous, and therefore highly to be deprecated, unless the insertion of the cord be most easily discoverable, and unless the principal bulk of the mass can be perfectly surrounded by the finger, introduced as in a common examination.

With these cautions in our mind, then, presuming the patient free from flooding, we are to wait a certain length of time for the expulsion of the placenta from the uterine cavity: but that time must necessarily have a limit.*

It appears to me that in the present day we are in the habit of following

* The management of the placenta has at different ages been conducted on the most diametrically opposite principles. From the writings of Hippocrates (Liber de Superfœt., cap. iii.) we gather that it was not the custom to use any means but the most gentle for the purpose of extracting it; but Celsus (lib. vii. cap. 29) plainly counsels us to introduce the right hand into the uterus, and remove the secundines, *quoties infans protractus est.* Since, however, the chapter in which these words occur is dedicated to the method to be employed for delivering a dead child, and since they immediately follow his instructions to that effect, we may naturally conclude that this interference was only recommended after a forced delivery had been resorted to, and not in common natural cases; and the word *protractus* seems to favour such an opinion. It has been supposed, indeed that Celsus counselled this hasty removal of the

the most rational and judicious practice, in regard to the management of the placenta, which has ever been adopted. With the fatal consequences

placenta upon all occasions; and Denman (chap. xv. sect. 8) has evidently adopted this view; but I cannot think it is justified by the expression employed. Ætius, (tetrab. iv. sermo iv. cap. 24,) who borrows this part of his work also from Philumen, recommends that the placenta, when retained, should be removed by the introduction of the left hand; and that if the os uteri be shut, and the operation consequently rendered difficult, relaxing means should be used: that the endeavours, however, should only be persisted in for the first and second day, and if unsuccessful, that the woman must no longer be fatigued; for in a few days the mass will putrify, and come away in a dissolved state. Paré (lib. xxiv. cap. 17) recommended the removal of the placenta immediately the child was born; but at the same time cautioned his readers that it was to be done in the gentlest and softest manner—first, by pulling at the funis; and if that did not succeed, by the introduction of the hand into the uterus. Paré's advice was but partially followed; the practice inculcated was implicitly adhered to for many years, while the excellent cautions by which it was enveloped were entirely forgotten; and hence the most disastrous effects resulted. The hand was rudely thrust into the uterus on all occasions, and the placenta as rudely torn away. Nor did this mischievous custom receive a check in England till Dr. Hunter determined to oppose it with all his authority; for the instantaneous withdrawal of the placenta was taught by Chapman in 1733, and sanctioned by Manningham in 1739, in the practice at the lying-in ward of St. James's Infirmary, which was the first attempt at the establishment of an hospital for parturient women in this metropolis. In Smellie, also, we find the same system prevailing, though in some degree modified. He directs us to let the woman rest a little after the fatigues of the birth, unless there be danger of hæmorrhage, that the uterus may, in contracting, have time to squeeze and separate the placenta from its inner surface;" then turning the funis round two fingers, or wrapping it in a cloth, to pull gently from side to side, desiring the woman to assist our endeavours "by straining as if she were at stool, blowing forcibly into her hand, or provoking herself to retch, by thrusting her finger into her throat." If by these methods the placenta cannot be brought away, to introduce the hand and deliver it, (chap. ii. sect. 5.)

Some years before Hunter commenced practice, Ruysch, whose name is justly rendered famous as an anatomist, particularly by his employment of wax injections to aid in dissection, had been appointed President of the Obstetric College at Amsterdam, and was empowered by the magistrates to regulate the practice of midwifery in that city. Numerous cases having come within his knowledge, illustrating the fatal effects consequent on the barbarous custom of that age, he wrote with much force and ingenuity against it, forbidding the extraction of the placenta in any case; and from his spirited opposition we may date the commencement of the present improved practice. Ruysch certainly trusted in much too great a degree to the unaided efforts of Nature, and ran into the opposite extreme from the custom he deprecated. (Advers. Anat. Dec. Sec., sect. x.) Much allowance must, however, be made for the strength of his language, and his universal reliance on Nature's powers, since his arguments were intended to uproot a most pernicious and dangerous practice; and they must be regarded, therefore as those of a partial advocate. Hunter, induced by the same feelings, and having witnessed the same kind of calamities, adopted the system Ruysch was so powerfully advocating; and we are told by Denman, (Loco Proximè Citato,) on the authority of Dr. Hunter himself, that after much thought and hesitation, his colleague in the obstetric department of the Middlesex Hospital, Dr. Sandys, and himself agreed to leave the placenta to be expelled entirely by nature, without attempting to render any assistance whatever. In the first instance in which this *experiment* was tried, twenty-four hours elapsed before the placenta passed; but as no ill consequences followed, the trials were repeated; and it soon became the general

attendant on profuse floodings always before our mind, we do not hesitate to remove the placenta by the introduction of the hand into the uterus, as soon as a discharge occurs to such an extent as to bring the patient's life into the least peril: and we think ourselves warranted also in abstracting it by the same means, provided it is not expelled within a limited period. The time, therefore, that we are to wait before proceeding to withdraw it, becomes a matter for our consideration of deep interest; and I cannot help thinking that four hours, as advised by Hunter and Denman,* will in general be found too long. In my own practice, provided there is no hæmorrhage, I am generally in the habit of delaying operating for an hour or an hour and a half after the child's birth; and I consider it most probable, that if the placenta be not expelled into the vaginal cavity at the expiration of that period, and there be not more than the usual discharge, it will almost always be found extensively adherent to the uterine structure; for if morbid adhesion does not exist, we may expect that the mass will be separated, and hæmorrhage will necessarily result. Should this prove the case, then, it is most likely that every hour's delay will increase the strength of the uterine contractions around the placental body, and consequently add to the difficulties which will beset us in our endeavours to remove it.

Still, however, under these circumstances time must not entirely guide us, nor its lapse be our only indication for the removal. The state of the uterine contractions must not be overlooked. Should the womb be acting powerfully and vigorously, I should be induced to abstract the placenta earlier than the specified period, under the belief that adhesion had taken place, or that irregular contraction in the uterine fibres was the cause of its being retained, and that nature would not be able to surmount the difficulties of the case unaided; while, on the other hand, if the uterus remained inactive and sluggish, I might be inclined to delay longer, provided there was no alarming discharge, in the hope and expectation that it would, after the lapse of a little more time, resume its expulsive action, and that the case would be terminated without manual assistance; and this particularly if the contractions during the birth of the child had been feeble, or the labour lingering. I feel convinced, that in the majority of those instances where the placenta has been naturally expelled after a re-

rule in that establishment to leave the expulsion of the mass to Nature's unassisted powers. The occurrence, however of some fatal cases induced Dr. Hunter to modify his treatment; and it is well known that, before his death, he was in the habit of removing the placenta by the hand if flooding supervened; and I believe he also recommended its withdrawal at the expiration of four hours from the child's birth, if it had not previously passed, although there might be no hæmorrhage.

* Introduction to Midwifery, chap. xv. sect. 9.

tention of many hours, it has been lodging the principal part of the time in the vagina, totally excluded from the uterine cavity; and this I think very likely to have happened in the case related to have occurred under Dr. Hunter's superintendence, because the principle on which it was conducted was that of perfect non-interference.

Absorption of the Placenta.—Cases are on record in which the placenta never passed from the uterus; it having been supposed that the whole or the greater part of it had been absorbed by the action of the uterine vessels;—and some practitioners are strong advocates for ascribing to the uterus the power of absorbing portions of placenta, when left after the child's birth.* Knowing the astonishing resources which Nature possesses, and the wonderful contrivances she adopts for the purpose of restoring the system to a healthy state, we should scarcely have the temerity to deny the possibility of such an occurrence, even were it not contended for by respectable authority; but we should certainly not expect that the placental mass, or any great proportion of it, would be removed by such means; and we should be acting most unwisely if we were induced by that hope to leave it in the uterus, without making efforts to extract it.†

* Nägelé entertains this opinion; (see a communication by Merriman in Med. Gaz. vol. iii. p. 189, of part of a paper furnished by Nägelé to Dr. Von Froriep's periodical, "Notizen aus dem Gebiethe der Natur und Heilkunde," where four instances of permanent retention of the whole placenta and one of a part are recorded.) So does Prof. Salomon of Leyden; see Rigby's Mid. Reports, Med. Gazette, vol. xiv. p. 334. Two instances are there mentioned, in which no part of the placenta at full time ever passed away. One related by the late Dr. Young of Edinburgh, the other by Prof. Salomon. Dr. Rigby follows Nägelé in this, as in most other of that distinguished physician's views. Velpeau cites three cases which he had seen, where after abortion the placenta did not come away; he thinks these were absorbed, and seems inclined to believe in the possibility of the same process taking place after delivery at full time. (Traité des Accouch. Art. Résorption du Délivre.) To this work I would refer the reader for a notice of the chief number of well-attested cases of this description on record. Ingleby (on Uterine Hæmorrhage, p. 206) coincides in the possibility of absorption; but supposes that the absorbent vessels themselves, and not the veins of the uterus, are the agents of its removal. On the other hand, Dr. Rumsey, in an inaugural thesis, published in 1837, combats the idea of the whole or any portion of a disrupted placenta ever being absorbed: he thinks that when not expelled entire, or broken down by putrefaction, the parts left behind become organized and amalgamated with the structure of the womb itself.

† In the year 1829 I was requested to visit a young woman, on the sixth day after delivery of a first child, in consequence of the placenta being still retained in utero. I learned from the gentleman who had attended the case, that the labour had been lingering; that the child at full time was born dead; that the funis had broken from the placenta soon after the birth, and that the mass had never come away; but that there had been no hæmorrhage. I found the uterus painful, and considerably larger than it should have been, had the cavity been empty; the discharge from the vagina was scanty, and slightly putrid. The os uteri was almost closed, and I could feel no part of the placenta. She was suffering under a slight degree of fever; but there were no urgent symptoms of immediate danger. Two days afterwards

Retention of the Placenta.—The placenta may be unduly retained in utero by three different causes, each acting separately, or two in concert. They are, *first*, atony of the uterus; *secondly*, spasmodic or irregular contraction of the uterine fibres; and *thirdly*, morbid adhesion having taken place between the placental and the uterine surfaces.*

Retention from atony of the uterus.—It is generally observed, that when a want of due and sufficient energy on the part of the uterus prevents the proper contraction of its fibres, for the purpose of expelling the placenta, the occurrence takes place in cases where the woman has had a number of children—where the uterus has been acting feebly during the previous stages of the labour—where a long interval has occurred between the expulsion of the head and the passage of the shoulders: after lingering labours also; and in cases where the patient has been delivered by instrumental aid, in which the uterus has become worn out, and the powers of life much depressed. It is equally likely to happen if, when the head is expelled, the attendant has suddenly, forcibly, and improperly, extracted the fœtal body from the uterine cavity; after which reprehensible interference the womb is left in a flabby, relaxed, and torpid state, disinclined to continue its active contractile efforts for the expulsion of the placental mass.

We may know that the placenta is in utero by observing, on the application of the hand externally, that the organ is larger than it should be if emptied; and by feeling that no part of the placenta, or only a small portion of it, is protruded into the vagina. But do we know why it is retained in the uterus?—Can we tell which of the three causes I have mentioned is in operation?—We cannot discriminate *positively*, except under the introduction of the hand into the cavity itself; but our *suspicions* as to the true cause may be strong, and probably correct. We may presume that atony is the cause, if, after the birth of the child, the uterus remains soft, large, and flabby; if there be no after-pains; if, when we take hold of the funis—and this is a good indication—we find that the vein is not full, that it is quite flaccid; because, if the placental mass be squeezed by the uterus contracting upon it, the blood will be forced down

she appeared much in the same state. My friend watched her narrowly for more than a month, during which time a portion of placenta, the size of a walnut, was expelled. She recovered her health perfectly, and returned to her friends, whom she had been obliged by circumstances to leave, in about six weeks. I am informed that nothing more passed of a solid character; but whether she ever menstruated after, I do not know. I shall not enter into any speculations on the case, as to whether absorption may have taken place, or what change may have occurred in the placenta itself; but I place every reliance on the statement, that so long, at any rate, as she remained under my friend's immediate superintendence, the placental mass did not escape from the vagina.

* Adhesion may exist in combination with atony, and also with spasmodic contraction.

from the placenta into the cord, under which action the arteries and vein become turgid and distended; and we may frequently observe it twist in a trifling degree, or writhe spontaneously, somewhat like an eel, as often as a fresh contraction occurs in the uterine parietes. This twisting is produced by the blood passing gradually downwards along the vessels, which are seldom straight, but almost invariably follow a spiral course, and being prevented escaping by the ligature binding their cut extremities.

Where the placenta is retained by atony of the uterine fibres, the blood is generally speaking, poured out in a copious stream, provided any portion of the organ be separated from its previous attachment; because the uterus being uncontracted, its vessels continue large; and their open orifices are not plugged in the least degree, as occurs when the womb has closed itself strongly around the mass retained within its cavity.

Treatment.—What method, then, shall we adopt under this state?—Are we to remove the placenta immediately hæmorrhage shows itself by introducing the hand into the cavity of the womb; or can we stimulate the uterus to contraction, so as to induce it to throw off the mass without the necessity of so harsh a proceeding?—By pressure, friction, and the application of cold, we may frequently excite such efficient action that the placenta will gradually descend into the vagina, and the introduction of the hand be rendered unnecessary. But we must always bear in mind, that these means ought not to be trusted to exclusively and entirely, under a continuance of copious discharge; and that frequently the manual removal of the placenta from the uterine cavity itself, will alone check the flow, and place the patient in a state of safety.

If, under a retention of the placenta from atony of the uterine structure, there be little or no sanguineous appearance, and no disposition to faintness supervene, fifteen or twenty minutes may be allowed to pass without any artificial means being used to solicit the renewal of uterine action. On the expiration of such a period, pressure may be applied to the uterus by the hand placed externally; or gentle friction may be made over the hypogastric region. Should an unusual discharge of blood now take place, cloths dipped in cold vinegar and water may be suddenly laid upon the lower part of the abdomen and the vulva, and the pressure and friction persevered in; and should the discharge continue to an alarming extent, or increase to a profuse hæmorrhage, the removal of the placenta must at once be undertaken. All other considerations must give way to procuring an emptied and *contracted* state of uterus; and that can only with certainty be accomplished by the withdrawal of the placenta. Many a woman has fallen a victim to the timidity of her attendant; many a life has been sacrificed by the trial of trifling means, perfectly inade

quate to the production of the grand end proposed—the contraction of the uterine parietes, the evacuation of its cavity, and the perfect closure of its vessels. I should have but little faith in the efficacy of cold water injected into the uterus, while the placenta was retained in the cavity, although strongly recommended by Gooch.* It may be useful in floodings, after the placenta is expelled, but even then can by no means generally be resorted to, because the necessary implements may not be at hand. And I should bave still less faith in emptying the umbilical vessels of their blood, with the hope of diminishing the size of the placenta, as suggested by some physicians;† or in injecting the umbilical vein with cold water,‡ diluted vinegar,§ or brandy,‖ or any astringents, as practised by others: the great objections to all these measures being, that while we are employing them, the blood may be gushing from the uterus, and the patient is dying; that we are uncertain whether morbid adhesion may not exist at the same time, in conjunction with deficient energy in the uterine fibres, which may eventually require manual separation; and that the introduction of the hand is the strongest provocative to uterine action of any means we can resort to. The same objections apply to throwing purgative clysters into the rectum, as noticed by Blundell;¶ as well as to the use of the ergot, which, although it have the power of exciting contraction in the uterine fibres, requires some time for the establishment of its action; and, if the placenta were at all firmly adherent, must fail in bringing about its expulsion.

When the necessity, then, for the removal of the placenta is apparent, and we dare no longer trust to more mild and less powerful agents, the operation must be undertaken in the following manner:—

The patient lying on her left side, conveniently near the edge of the bed, we must take off our coat—as in all cases where it becomes necessary to introduce the hand into the uterus;—denude the left arm and grease it;** then kneeling down by the bed-side, we bring the fingers into the form of a cone, twist the funis umbilicalis two or three times round the first and second fingers of the right hand, to give us a guide to the placenta, and quietly insinuate the left into the uterus. There is little or no difficulty in passing it through the external parts, vagina and os uteri, if the operation be undertaken within an hour or two of the child's birth; nor is there any difficulty in introducing it fully into the uterine cavity, because

* Compendium by Skinner, p. 172. † See page 133, note.

‡ Taroni; Rev. Med., Sept. 1827.

§ Mojon; Nuevo Mezzo di Estraere la Placenta, &c., 1825.

‖ Hoffman; Ann. Univers., Juin, 1827. ¶ Obstetricy, by Castle, p. 616.

** Hamilton (Pract. Obs., p. 171) strongly recommends the right hand to be used for the removal of the placenta from the uterus; as do other practitioners.

the parietes are in a flaccid condition, and the cavity itself is both considerably distended, and readily dilatable.

The removal of a placenta from the uterus, indeed, retained by simple inertia, is one of the easiest operations in surgery; but the condition requiring its adoption is of a highly dangerous character; and the danger will be in proportion to the facility with which the organ admits the hand. The danger, then, is not that we should bruise or lacerate its structure, or dispose it to inflammatory disease, but that we should leave it in an uncontracted state after the withdrawal of the placenta, and consequently subject the woman to a continuance of the hæmorrhage. It certainly far more frequently happens, that the stimulus of the hand causes the uterus to act, and that in contracting it expels the hand and placenta together; and this is a fortunate occurrence; it is to be hailed as the best proof of safety.

Whenever we are compelled to resort to manual extraction, we must bear in mind, that previously to the introduction of the hand, we cannot tell in what situation we may find the placenta; it may be entirely thrown off from the uterine surface, and lying loose in the cavity; or it may be partly separated, and partly attached; or it may be partially, or through its whole extent, morbidly adherent. For these reasons we must not always calculate on meeting with so easy a case as I have just described; we must not suppose that all we have to do is to introduce the hand and draw out the placenta. If we act in this way, we may find the case much more difficult than we expected; we may lose our presence of mind; we may withdraw our hand in doubt and disappointment, cause a serious aggravation of the flooding, and increase the previous peril. Let us, then, before operating, make up our mind to have to encounter the most difficult of all the cases of retained placenta which can possibly occur; and should we find it more easily managed than we anticipated, our error, if it be one, is on the right side.

I will suppose that it is partly attached, but not morbidly adherent. We pass the left hand gently into the uterus, guided by the funis; and on its introduction place the right hand between the woman's thighs on the abdomen, to steady the uterine tumour externally; for that organ being so much smaller than it was before the birth of the child, the parietes of the abdomen do not support it, but it rolls about in the abdominal cavity, impeding our endeavours to remove the mass. When the hand has fully gained possession of the cavity, we tear the membranes with our fingers, and passing them between the placental and uterine surfaces, run our hand all over the maternal face of the placenta, to be assured that we have got the whole organ within it, grasp the uterus externally with the right; and it is most probable that, from the double stimulus thus applied,

—that of irritation within, and compression externally,—a contraction will occur; we may then quietly withdraw our hand, retaining the placenta within its hold. Should, however, this desirable action not supervene, we may keep the hand a short space within the cavity, and endeavour to ensure contraction, by gently moving our fingers, so as to irritate the parietes in some trifling degree.

On the entire withdrawal of the mass—whatever may have been the cause obliging us to have recourse to its removal manually—we must never forget to examine whether or not it be entire; for it is possible that the whole may not have been extracted. It is not unlikely that adhesion may have taken place between a portion of its structure and the uterus itself; that instead of passing the hand over its whole face, we may have broken it, and brought away only a part, leaving the remainder in the uterine cavity. To assure ourselves that we have removed it all, we must lay it upon a napkin, with the maternal face upwards. If there be a large portion wanting, we cannot be deceived; we observe that the mass is broken, and we see the cavity from which a piece has been separated.* If, then, we find that a third, or a quarter, or any other large quantity be missing, we should immediately introduce the hand a second time; for it is much better to remove the disruptured portion than to leave it to be thrown off by Nature. This should be done before the uterus is contracted around it; and if much difficulty be experienced, we must desist from our attempts. But if there be only a number of small filaments left, it would be injudicious to make any exertion for their removal; since we must put the patient to much pain, run the risk of doing permanent injury, and in the end, most likely, not accomplish our object.

Retention from irregular contraction.—The second cause of retention is irregular contraction in the uterine fibres. This generally happens after the uterus has acted violently, when the child has been very rapidly ex-

* From the neglect of this very simple proceeding, I have known many cases of great danger occur. A medical friend called me to his assistance on the appearance of violent hæmorrhage, after, as he believed, the placenta was removed. Immediately I placed my hand on the abdomen, I felt satisfied that the whole, or principal part of it, was still within the uterus; but, on inquiry, was informed that it had come away on the application of the slightest traction possible. On requesting to inspect it, an utensil was brought which it was supposed contained the placenta. There was the funis entire—there were all the membranes—and there was a large mass that looked like the placenta lying below the membranes. On turning it up, however, no part of the placenta was there. The cord and membranes had slipped away from their attachment to its body, and a large quantity of blood had collected within the membranes and there coagulated, which was mistaken for the placenta itself. If, instead of being satisfied with the appearance of the funis and fœtal membranes, my friend had made his examination, as I have just recommended, the mistake could not have happened; and the cause of the continuance of the hæmorrhage would have been at once apparent. For a case almost precisely similar, Velpeau, (edit. Bruxelles, p. 309,) may be consulted.

pelled, its whole body being projected forth probably by one pain, and under the same action the organ has contracted strongly around the placenta; or where improper attempts have been made to remove it from the uterine cavity by pulling and jerking at the funis. In this case, then, either all the fibres shorten themselves simultaneously, or some are in a contracted state while others are dilated; instead of the action being regularly progressive from the fundus downwards. Upon this occurrence taking place, two or three strong pains will generally follow each other in rapid succession, soon after the expulsion of the child; and sometimes they are almost as severe as those experienced before the perfection of the birth. If the uterus act strongly in this way, while the placenta does not descend within reach of the finger, if the funis umbilicalis become full and turgid with blood, and if the uterus feel very hard, as well as large, to the hand externally applied, these symptoms are suspicious of the state I am describing. Generally speaking, under these cases there is not such violent hæmorrhage as when atony is the cause of delay; and some time may frequently elapse without there being such a degree of flooding as would induce us to remove the placenta.

Let us, however, not wait longer than the limit before assigned—one hour and a half, and in the mean time we may consider whether we can, by any internal medicines or outward applications, overcome the spasmodic state. External means seem of little service, and of all medicines, opium, perhaps, is the only one which can procure the relaxation sought. It is, indeed, very generally recommended under this state. Opium in moderate quantities I should not object to; but I have a decided aversion to its employment in large doses; because its influence may be greater than we anticipated—the opposite condition to that previously existing may be produced; the uterine powers may be paralyzed; and, although the difficulty in the removal of the placenta may vanish, the contractions necessary for the ultimate safety of the woman may never be resumed. Again: it is more than probable that adhesion may co-exist with this irregular action; and if such be the case, the introduction of the hand will eventually be required. Still greater objections apply to the abstraction of blood by the lancet, for the purpose of relaxing this spasmodic contraction—a means which has occasionally been resorted to;* but which I should strongly deprecate, even although there might be no flooding; for

* Gardien (tom. iii. p. 256) recommends bleeding in conjunction with other means, before an attempt is made to remove the placenta manually. Blundell (Obstetricy, p. 625) thinks some few cases might justify the use of the lancet; and states that he has abstracted sixteen or twenty ounces of blood with the view of producing relaxation. Ingleby (Ut. Hæmor., p 198) says, "this measure will rarely be found admissible, except in the instances of plethoric women, and in the absence of hæmorrhage."

I should dread the probability of a copious discharge from the uterus, so long as that organ remained unemptied and uncontracted. Should apoplexy or convulsions, indeed, occur immediately on the child's expulsion, bleeding would be indicated, and it might be highly proper to open a vein, even before any part of the placenta passed into the vagina; but I am now speaking of venesection as a means of overcoming that spasmodic state of the uterus which prevents the placenta descending.

On the other hand, I should equally object to the use of those means which will increase the tone of the uterus—such as the ergot of rye. In my own practice, indeed, I am in the habit of relying only on the careful removal of the placenta by manual operation;—the indications being lapse of time on the one hand, and flooding on the other.

Irregular contraction is of various kinds. Sometimes the uterus contracts globularly on the placenta, Plate, XLIX. fig. 135, sometimes longitudinally, assuming somewhat the shape of a sugar-loaf; at others, it contracts with a corner, fig. 136, so that in one part or other there is a sac, in which the principal bulk of the placenta is retained; the other portions of the organ being in a relaxed state. Sometimes it contracts with a sharp ridge anteriorly, something like a hog's back; but this is rare. At others, again, the central fibres of the body of the uterus act powerfully, leaving those of the fundus and neck uncontracted, and the hour-glass state is produced; fig. 137; the placenta being prevented from descending, by the constricted ring formed by the circular fibres of the body.*

* We hear much of hour-glass contraction of the uterus, but my belief is, that there is no rarer case in midwifery than the real and true hour-glass contraction, such as I have described. Professor Burns, indeed, states, that "in almost every instance this contraction takes place; that he scarcely ever introduced his hand into the uterus, in a case of flooding, without meeting with it, whether the placenta had or had not been expelled."—(Princip. of Mid., 5th edit., p. 485.) Burns' authority is great on all subjects connected with the obstetric department of medicine, but in this sentiment I can by no means concur; and I am certainly not singular in my opinion; for Ingleby (Op. Cit., p. 192) looks upon this case as of "very rare occurrence," Blundell (Obstetricy, p. 623) says "it does not happen so often as many imagine," and other practical men have expressed themselves in similar terms. I can scarcely suppose the Professor himself could be mistaken, and presume (although this does not appear from his writings) that he and I do not apply exactly the same meaning to the term "hour-glass contraction;" but I am almost persuaded that the general idea of the occurrence being so frequent, has its origin in error:—that the contraction of the uterus, indeed, is of the globular kind; that its whole cavity is considered the upper chamber; the os uteri being taken for the constriction of the central fibres of the body, and the dilated vagina,—having in it a coagulum of blood,—for the lower chamber. In many cases I have been told that an hour-glass contraction existed, but, when I came to examine for myself, I found it was of a mere simple globular kind. Out of a very large number of instances, in which I have been called upon to remove the placenta, I do not recollect to have met with more than three or four that perfectly agreed with my idea, of the true hour-glass contraction. Some practitioners, again, consider that

Fig. 135.

PL.XLIX.



Fig. 136.



Fig. 137.



Sinclair's Lith.

could not introduce my hand, and that without injury to the uterine structure, provided the term of gestation were nearly completed. Our obvious indication, if we were foiled, would be to place the patient in some degree under the influence of opium, and take advantage of the earliest opportunity of its action to renew our attempts: for the longer we wait, the more difficulty we shall experience from the permanent contraction which will assuredly take place, and which we have no means, as far as I have been able to judge, of removing.

Another kind of irregular contraction sometimes occurs—the two rapid closure of the os uteri during the passage of the placenta through it; by which action the mass is detained prisoner, lying partly *in utero*, partly *in vagina*. Any attempt to draw it forth by pulling at its edge will usually be followed by a laceration of the placenta itself, and a cautious dilatation of the orifice is generally required for its removal.*

Retention from morbid adhesion.—The last case is the most difficult of all: that in which morbid adhesion takes place,—agglutination between the two surfaces of the uterus and placenta,—in consequence, most probably, of a deposition of coagulable lymph, the produce of a peculiar kind of inflammation which the lining membrane of the uterus has taken upon itself during pregnancy.† The adhesion may be of greater or less extent,

* See Hamilton's Pract. Obs., 1840, p. 178. This case I have frequently met with.

† Many reasons induce me to believe that this morbid adhesion is produced by the formation of a fresh membrane, the consequence of inflammatory action existing in the uterus. In the first place, we find adhesion of the placenta more frequent among the lower classes than in the higher circles; and this is easily explained upon the greater liability of the poor to such accidents during pregnancy as are likely to induce inflammation in the uterine structure, which may terminate in the agglutination of the two surfaces together.

I have often myself known adhesion of the placenta follow an injury during gestation; and I have frequently inquired of my patient after having removed an adherent placenta, whether she has suffered pain in the belly during pregnancy, and her reply has very usually been, "Yes, just where your hand was,"—my hand, for the purpose of the separation, having been carried to the part where agglutination had taken place. From observing, then, that the patient, while pregnant, has had a fall, or received a blow; that she has experienced pain, evidently the result of inflammation,—I think that there is no doubt that the morbid union is the effect of the same kind of action in the vessels of the uterus as occasions the formation of false membranes in other parts of the body; and I see no reason to believe otherwise. I do not mean to state that adhesion will be met with in every case where pain in the region of the uterus exists during gestation, because that pain may be spasmodic or neuralgic, and not the effect of inflammatory action; besides, the whole structure of the organ need not be the subject of the disease, although it were inflammatory: the lining membrane may possibly escape: even should the mucous membrane be implicated, the affection may be situated in a part remote from the implantation of the placental mass, and consequently no change can be expected to occur at that particular spot. Again, let us suppose that the very point at which the fœtal organ is attached has become the seat of injury and subsequent inflammation, still it is evident that resolution may occur,—that effusion of lymph need not take place, and that

and of a higher or lower degree of intensity. Sometimes the whole placenta becomes united by adhesion, of which I have known instances; at others, the part adherent may not exceed a sixpence in extent; but the union may be so firm that the unaided efforts of the uterus, however strongly excited, are not sufficient to produce entire separation of the mass. Professor Burns* mentions a case in which the placenta was retained four days, and a fatal termination ensued, although the surface morbidly adherent was not larger than a shilling.

As a general principle, the larger is the surface detached from the uterus the more copious will be the hæmorrhage, because the greater is the number of vessels opened; and if the adhesion be entire, the sanguineous appearance will be but very trifling; no blood flowing, indeed, out of the vessels in connexion with the placenta, and all that is lost being afforded by the small arteries which communicated with the deciduous membrane.

Whenever half an hour or an hour has elapsed since the birth, without the appearance of any discharge, while at the same time three or four smart uterine contractions have taken place, we may begin to suspect not

no difficulty may arise in the labour; so that there are a great many chances against the production of the effect I am describing.

My belief, however, that this morbid adhesion is caused by inflammation of the lining membrane of the uterus, is also strengthened by having observed this state occasionally follow accidental hæmorrhages towards the close of pregnancy. Cases are not unfrequently met with in which two or three eruptions of blood having taken place, consequent on some external and easily assignable cause, the hæmorrhage gradually ceases, and does not return; but, under labour, adhesion of the placenta is discovered.

I presume, under such circumstances, that the cessation of the discharge depends upon an agglutination of that portion of the placenta, previously separated, with the uterus: nor is the explanation difficult. The two surfaces remain in contact, though not attached, having been disunited from each other by some accidental cause; and to prevent a continuance of bleeding, and to save life, Nature makes a strenuous effort; inflammation is set up in the membrane of the womb, by which the placenta is glued to the uterine surface, and thus the open vessels are permanently closed. Such a change is not more extraordinary than many of the contrivances to avert danger, which we daily observe Nature to practise, and quite in accordance with the mode she generally adopts to repair injuries.

Moreover, I have had occasion to notice, in an early part of this work, that disease sometimes takes place in the placenta itself. Occasionally the mass becomes studded with tubercular formations, like small scirrhous glands: sometimes there are spiculæ or granules of bone strewed, as it were, over the maternal surface, and sometimes the organ becomes almost cartilaginous throughout; at others, unnaturally soft;—these states being frequently connected with adhesion under labour. It is fair to presume, then, that the uterine membrane is excited and irritated by contact with the diseased mass, and that inflammation is the primary, and effusion of lymph the secondary, effect.

When all these circumstances are considered in conjunction, there can be little doubt that the morbid change occasioning adhesion of the placenta, is to be referred to excitement of the uterine vessels as the immediate agents, and not to the fœtal system.

* Op. Cit., p. 490.

only that the placenta is morbidly adherent but that throughout its whole extent; because, if any part were separated, some vessels must be rendered patulous. This is certainly a rare case, but it has happened to me two or three times to meet with it.

The intensity varies in degree as much as the extent: it is sometimes so slight, that, notwithstanding the uterine powers cannot accomplish the expulsion of the mass, yet it may be separated by the hand with the greatest ease; in others again, the adhesion is so strong that it is impossible to peel it off from its attachment. Instances are sometimes met with in which a portion of the placenta is so closely attached to the uterine surface, that it cannot by any means be removed; nay, I have opened more than one body where a part was left adherent to the uterus, and where, on making a longitudinal section of the organs, and examining the cut edges, I could not determine the boundary line between the uterus and the placenta, so intimate a union had taken place between them;* the student may readily imagine, therefore, the difficulty which must sometimes be experienced in attempting to remove it when adherent.

When called upon to separate an adherent placenta, we may find the uterus flabby and uncontracted, or it may have embraced the mass more or less tightly. It is most usual for a contracted state to exist in conjunction with morbid adhesion, because the probability is, that the uterus will have made some efforts to expel it, and not being able to protrude it from its cavity, it will have closed upon it. We shall also sometimes meet with it partially extruded from the uterine cavity, and a greater or less portion lying loose in the vagina, and we may trace it passing through the os uteri, and find another part adherent to the organ within.† This condition can hardly happen, indeed, unless the attachment had been originally much lower than is usual, or unless the placenta be oval rather than round in form; but when it does occur, it may be the cause of much embarrassment, and, if not understood, of great danger. So long as any portion remains connected by morbid organization with the uterine surface, so long any attempts to remove it by traction at the cord, or even by pulling at the placenta itself, must be in the highest degree hazardous; and for this reason I have, on a former occasion, inculcated the caution not to attempt its removal by the agency of the funis, until not only the insertion of the cord can be easily distinguished,—not only the bulk of the placenta can be clearly felt, but its general body can be completely surrounded by the finger, introduced as in a common examination. The management of

* See Hamilton's Outline 1840, p. 168; my father's Practical Observations, p. 75; and Barlow's Essays, p. 250.

† See my father's Practical Observations, part i. p. 78; and Ingleby on Uterine Hæmorrhage, p. 200.

the case I am supposing must be conducted on exactly the same principles as if the whole organ was shut up within the uterine cavity.

We may *suspect* that morbid adhesion exists, if after the birth of the child the placenta does not descend, although the uterus continues moderately active; and if, on putting the funis rather on the stretch, and then letting it suddenly go, it springs up with a sort of jerk: but we can only *positively* detect the true nature of the case when the hand is in the uterus for the purpose of taking it away.

Treatment.—The removal is to be conducted on exactly the same principles as I before mentioned. The hand is to be carried up to the placenta; we are to seek for an edge which has been separated, and is lying loose; insinuate the fingers cautiously between this and the uterine surface; and by gently moving the hand from side to side with a sawing kind of motion,—keeping the palm towards the placenta, and the knuckles next the uterus,—we continue the separation until we find that we have encompassed the whole of the organ, and that it drops loose into our hand: or if the adhesion be too firm to give way to this mode of proceeding, we may often succeed in removing the whole by cautiously working, or picking the adherent portions off, as it were, with each finger separately.

Either of these methods is in my estimation by far preferable to that recommended by Hamilton* and Burns†—expanding the fingers over the fœtal surface, and squeezing the edges towards the centre; because, if the agglutination be firm, we are very likely to break the placenta, and leave filaments still adherent. The principal, and indeed the only objection to the plan I adopt, is the chance of bruising, scratching, or slightly tearing the uterine membrane with the ends of the fingers, the nails, or the knuckles; and no doubt, if the nails be long, pointed, or rough, at their extremities, or the operation be performed hurriedly or inconsiderately, such accidents are very likely to happen; but I take it for granted that due caution will be used, and I am myself not aware of ever having inflicted injury under the operation.

The hand should not be withdrawn from the uterus until the entire separation is effected, and we must be most particular in removing every particle of the mass. I know that to get it all away is sometimes impracticable, owing to the strength of the adhesion; but such cases are fortunately rare. I know, also, that we are told by some authorities of great weight, that should the placenta break under the action of the hand, we are not to use much effort to procure it all, but remove what we can, and leave the remainder.‡ I cannot help thinking that such a doctrine is highly

* Op. cit. p. 171. † Op. cit. p. 363.

‡ Blundell, Obstet., p. 628; Burn's Princ. of Mid., p. 363; Hamilton, Pract. Obs., pp. 171 and 175; Davis, Obst. Med. parag. 1063.

dangerous, by impressing the student with the belief that *in many cases its entire separation is impossible*, and perhaps by lulling him into a fatal carelessness. It would be my wish, on the contrary, to inculcate the idea that the *whole* can very generally, and ought, even at the expense of some trouble, to be removed; and that we should never feel satisfied that we have done our duty, unless we have used our best endeavours to effect its entire abstraction. The recommendation given by those practitioners who think differently with myself, is founded on the supposition that more danger would accrue by our attempts at separating the strongly-adherent portions than by leaving a part of it behind. From some practical observation, however, I am persuaded that very few states after delivery are fraught with such extreme peril as that in which any portion of the placenta remains adherent to the uterine surface; and I believe, also, both that the uterine membrane is not so liable to serious injury as has been supposed, and that, if injured, it possesses great powers of reparation within itself: and for these reasons I consider it my duty strongly to enforce the practice I have just ventured to advocate. On examining the placenta, also, after its removal, if a large proportion be wanting, I think it better to introduce the hand a second time immediately, under the employment of the utmost tenderness, for the purpose of taking the disrupted piece away,—than to leave it to be expelled, to putrefy, to become perhaps the nucleus for hydatid formations, or to the chance of its absorption.

I have recommended, for the reasons assigned when treating of transverse presentations, that the left hand should be employed in the operation under consideration: other practitioners of experience prefer the right with Hamilton* and Merriman;† and others again, as Ingleby,‡ introduce the right if the placenta be attached towards the back part of the organ, and the left if forward; and they judge of the situation of the mass by the direction in which the funis runs upwards into the cavity. I am not satisfied that it is always, nor indeed generally, possible to tell whether the placenta be connected anteriorly or posteriorly, by tracing the funis up to the pelvic brim; and under every diversity of attachment, I am myself in the habit of using the left.

It cannot have escaped the observation of the reader, that the difficulty in removing an adherent placenta will be dependent upon two causes; partly the contracted state of the uterus in resisting the introduction of the hand, but principally the degree of its adhesion, both in extent and intensity; so that we have a combination of difficulties, only to be overcome by the most judicious management, and not to be undertaken except by one

* P. 171. † Synopsis, p. 147. ‡ On Uterine Hæmorrhage, p. 185.

who has acquired an intimate acquaintance with the structure of the parts.

Although, when the hæmorrhage is copious, the manual removal of the placenta is the only means to which we can trust for the closure of the uterine cavity, and the suppression of the discharge, still, if the patient be lying under a state of syncope, it would be improper to empty the uterus until the system has somewhat rallied, lest the organ be left in a flaccid condition, and on the restoration of the heart's action a fresh and more violent eruption should ensue; for it cannot be too strongly or too frequently impressed on the mind of the junior practitioner, that the removal of the placenta is not our only object, but that a chief part of our attention should be directed to producing a firm and permanent state of contraction in the uterus itself. Gooch, indeed, used to declare, "he could positively assert from experience, that the organ would contract even during syncope," but he acknowledged its action under such circumstances was feeble.* I do not mean to deny the possibility of contraction occurring under a temporary suspension of the vital functions; but I greatly fear that, in the generality of such cases, we should be disappointed in our expectation; and I am also convinced, that the safest plan is that I have just advised. The exhibition of stimuli, then may become necessary to rouse the torpid energies before the operation is proceeded in.

A morbid union appears occasionally, though very seldom, to take place between the fœtal membranes and the decidua, or the uterine surface, at a greater or less distance from the point of placental attachment; and if such an adhesion be to any considerable extent, it may prevent the occlusion of the placenta from the uterine cavity, and consequently be the cause of a retention of the mass. We should not, *à priori*, suppose that agglutination, by the deposition of coagulable lymph, would occur between the uterine membrane and the chorion, from the great dissimilarity of their tissues; but I am persuaded I have known not a few instances in which such an adhesion impeded the descent of the placenta into the vagina. The case must be treated, nearly in every respect, on the principles already laid down, and the separation is generally not difficult to be effected.

It is a remark made by most practical men,† that some women seem constitutionally subject to an adhesion of the placenta; so that this cause of danger exists in almost every successive pregnancy; and I have myself known several examples of this unfortunate peculiarity. It becomes, then, a point of some importance to ascertain whether, by any means applied during gestation, the danger might not be obviated. Quietude, rest, regular attention to the action of the bowels, an unstimulating diet, and the

* Compendium by Skinner, p. 175.

† Hamilton, Pract. Obs. p. 169.

occasional abstraction of blood—particularly if the circulation be hurried, or a fixed pain show itself in the uterine region—seem to offer the best chance of success. With regard to bleeding under pregnancy, I am certainly averse from it, unless there exist some grave occasion; and as a principle, do not coincide with those practitioners who have frequent recourse to the lancet to prevent flooding in labour, where the uterus is constitutionally disposed to remain flaccid after the birth of the child: because in such patients the powers of life are generally weak, the habit is relaxed, and the system not in a condition to bear up against the effects of depletion. If blood be formed rapidly, indeed—as is sometimes the case under pregnancy—the lancet may be advantageously employed for the object in question: and if there be undue determination to any particular organ, bleeding is even more necessary than in the unimpregnated state; for it is a common observation, both that inflammatory disease runs on to its termination more speedily during gestation, and that the loss of more blood is required for its subdual, than in the ordinary condition of the system; and I think I have on some occasions seen the advantage of the abstraction of blood in preventing placental adhesion.

Disrupted Placenta.—When a portion of the placenta is left in utero, the patient is generally harassed with violent after-pains returning at longer or shorter intervals, preventing sleep, and causing excessive irritability. By degrees the pain becomes more continual, and at last almost incessant, and is much increased on pressure being applied over the hypogastric region, and on putting the infant to the breast. On the first violent eruption ceasing, the uterine discharge is usually moderate, with the expulsion of occasional coagula. In the course of two or three days it assumes a character far from natural; it becomes sanious, of a dark and dirty brown colour, putrescent, and necessarily highly offensive to the smell; and, together with the exuding fluid, small shreds of putrid placenta will sometimes pass. Shortly the system in general sympathizes with the unhealthy state of the uterine organ; febrile symptoms, violent in degree, supervene, ushered in by one or more rigours; the pulse soon becomes rapid, and is generally small; there is heat and dryness of skin, more particularly on the abdomen; immoderate thirst; great anxiety both of countenance and mind; restlessness, almost amounting to jactitation; frequent sighings; occasional vomiting, or a distressing sensation of choking, especially on attempting to take fluids, and perhaps also on pressure being applied to the uterine region; uninterrupted wakefulness; a diminution in the secretion of milk; the tongue white, loaded, and slimy, or red, dry, and shining; and there is more or less headach, with wandering of the mind. Sometimes the pain in the head is of a pulsatory character, and constant; at others, of a sharp, darting kind, and intermitting. Another very common,

indeed almost universal symptom, is erratic pains in different parts of the body, most usually darting from hip to hip, or situated in the region of the diaphragm, much impeding respiration, and varying in intensity as in situation. The bowels at first are more torpid than ordinary, but after a time they become much relaxed, and there is difficulty in checking their action. As the case proceeds, the dangerous symptoms progressively increase; the strength hourly diminishes; the belly swells, and becomes tense; low delirium supervenes; the tongue acquires the typhoid character; vomiting of dark coffee-ground-like matter occurs; the extremities become cold; the fœcal evacuations and urine are voided involuntarily; subsultus tendinum comes on; and the patient sinks within ten or twelve days after delivery.

It is not always, however, that the disease runs this fatal course. Sometimes the putrid mass is thrown off from the uterus, and relief almost instantaneously follows: at others, the symptoms never assume such violence of form; and on the third or fourth day from delivery, a purulent discharge, almost devoid of any unpleasant smell, flows from the vagina, in which filaments of the placenta are discernible, and which often lasts for two or three weeks. I suspect this discharge to be a secretion from the inner surface of the uterus, consequent on inflammation, and to be a means adopted by Nature to get rid of the offending body, and always hail its appearance as one of the best signs we can observe. I seldom saw it afforded in such quantity as materially to depress the vital powers, and still less frequently have I known death ensue where it had been freely formed.* At other times, again, but very rarely, the remaining portion of placenta becomes the nucleus for hydatidinous formations; and more rarely still, it may be actually absorbed, or retaining its connexion with the womb, may possibly become organized.

Treatment.—When the hæmorrhage has ceased, which must be met by such means as have more than once been insisted on, our treatment must entirely depend on the violence of the symptoms present. The bowels must be moderately opened in the first instance, and their action restrained afterwards, if inordinate; the irritability of stomach may perhaps be allayed by effervescent draughts; and sedative medicines, either opium itself, or those of a milder kind, will generally be found useful. There exists a little difference of opinion among practical men as to the propriety of removing the after-pains by opiate remedies. My father† and Blundell‡ think it better not to interfere with the uterine contractions,

* "In rare and mild cases [of disrupted placenta] a puriform discharge has escaped from the vagina." Ingleby, p. 212.

† Pract. Obs. Part I. p. 167.

‡ Obs. by Castle, p. 612.

because through their agency it is probable the irritating mass may be expelled. On the contrary, others, as Ingleby,* regard opium as called for. For myself, considering the distress these pains produce, I think it better to alleviate them, more especially as they frequently fail in producing the good anticipated, and, by their severity, occasion excessive irritability. Bleeding from the arm will seldom be borne with impunity; but more relief will be obtained by the application of leeches to the uterine region. I have occasionally found benefit from counter-irritants applied to the side of the chest, or that part where the sympathetic pain was most acute; but not so frequently as I could have desired. As these pains, indeed, are usually erratic, and dependent (as I presume) on the state of the uterine membrane, it is reasonable to suppose that more advantage will be derived from local applications to the uterus or its neighbourhood, than to the immediate seat of painful sensation. Under this idea I have generally directed my attention to the uterus, and my means to overcoming the disease existing in its structure: next to leeches, then, I have thought relief has been obtained from external fomentations, and particularly injections of warm water into the vagina or cavity of the uterus itself. If the os uteri be not morbidly tender, the nozzle of a properly-contrived syringe may be passed just within the orifice; but if this attempt should give much pain, the vagina may be washed out every two or three hours. The application soothes the parts, by acting as an internal fomentation, cleanses them of any putrid fluid which may be lodging within them, and may perhaps even tend to separate the adherent portions of placenta, and bring them away. A weak solution of the chloride of lime or soda may be substituted for the plain water, sometimes with advantage. When the symptoms of excitement have merged into those of depressed powers, wine, æther, ammonia, bark, and aromatics, may be used; but their efficacy in restoring the system to a healthy state is, at the best, inconsiderable.

ACCIDENTS LIKELY TO HAPPEN ON ATTEMPTS TO REMOVE THE PLACENTA FROM THE UTERUS, BY PULLING AT THE FUNIS.—The cautions to which the student's mind has been directed, regarding the necessity of waiting until the placenta is wholly lodged in the vagina, before any attempt is made to withdraw it by the funis, are not without their object: for if the mass be adherent, we shall either separate it farther from its attachment; or we shall break it, leaving a part in utero; or we shall rupture the funis, or cause it and the membranes to slip away from the bed of the placenta; or, lastly, we shall invert the uterus itself. Of these accidents, breaking the funis is

* On Uter. Hæm. p. 221.

the least, inverting the uterus the most dangerous, in its consequences. If we break the funis, we certainly lose it as a guide to the placenta; but this is not of much importance. We can pass the hand into the uterus, and remove the placenta,—should such practice be necessary,—when the funis is broken off, almost as well as when it is entire, and its value as a guide is on the whole but trifling. If, by our improper interference, we separate a larger portion of the placenta, we shall bring on an increase of hæmorrhage, which will probably require the instant withdrawal of the mass. If we extract only a part, leaving a large portion behind, we shall also require to introduce the hand for the purpose of removing the remainder. But it is possible that we may even invert the uterus: for if the placenta be adherent to the fundus of the organ,—if the adhesion be strong,—if the funis does not give way to the force applied to it,—and if the uterus be flaccid, and have not contracted round the mass,—the fundus will descend, pass through the os uteri into the vagina, and the viscus will be turned inside outwards, as a pocket might be.*

Whenever this serious accident has happened (which may generally be

* The most horrifying case of mismanagement, perhaps, that ever occurred either in medicine or surgery, arose from an adhesion of the placenta, and is put on record by Dr. Boys, formerly physician-accoucheur to the Westminster General Dispensary. He was present at the dissection of the body, together with Mr. Brookes, Drs. Hooper, Fothergill, and several other gentlemen. They found wanting—the uterus, right ovarium and tube, part of the vagina, and part of the left fallopian tube; the greatest part of the rectum, cæcum, appendix vermiformis, the ascending portion of the colon, the right side of the transverse arch, all the ilium and inferior part of the jejunum,—altogether many feet of the small intestines,—with part of the mesentery, and the greater part of the omentum majus, which had been torn away from the right side of the large curvature of the stomach. The remaining portion of the transverse arch of the colon, and much of the jejunum, were torn from their attachments. The labour occurred on September 18th, 1807, and was complicated with an adherent placenta. The attendant broke the placenta by pulling at the funis. This produced hæmorrhage, and he left the patient. In about fifty hours, no attempt having been made to relieve her, the nurse found something hanging out of the external parts; and on his being apprized of it, he said it must be taken away, and placed her on her left side for that purpose. He made use of considerable exertion, and caused great pain. He then ordered a pair of scissors to be brought, saying there was a false conception, which must be removed: while using them the patient fainted, and died immediately. The parts removed by this brutal operator were preserved, and proved to be those I have just mentioned. We could scarcely suppose that such ignorance and barbarity could exist, as exemplied in the conduct of this case. But, independently of the precise account drawn up by Dr. Boys, (a letter on the Practice of Midwifery, occasioned by, and including an account of the late unfortunate case, by John Boys, M.D., &c., 1808,) we have father's testimony in corroboration; for he saw the parts in Mr. Brookes's dissecting-room. Ths man was tried at the Old Baily for murder, and was acquitted.

Ruysch (Pract. Obs. in Surgery and Midwifery, trans. 1751, p. 33) says he has met with two instances of inverted uterus within one week. After this declaration, we cannot wonder that Ruysch, placed in so responsible an office at Amsterdam, should have written so strongly against removing the placenta artificially in any case.

looked upon as the consequence of improper treatment,) it may be known by the placenta still remaining adherent, though perhaps external to the vulva; by the sudden appearance of the sensitive tumour which occupies the vagina; and by the womb not being discernible above the pubes by the hand applied over the abdominal parietes. It must immediately be restored to its former state; for the lapse of every minute will be of consequence, since the longer we delay, the more difficulty shall we experience in its reduction. For this purpose, the hand being half-shut, the back of the fingers are to be pressed firmly against the most depending point of the tumour; when the part will yield, the fundus will pass up with a sort of jerk, the organ will be restored to its natural situation, and the hand will occupy the cavity. The placenta may now be removed, as before recommended; and, on the hand being withdrawn, the greatest possible care must be taken that the inversion—of which there is some probability—does not occur again. Unless this restoration be effected within a short period of the time when the accident took place, I should presume either that the uterus could not be reduced at all, or that the hæmorrhage must be excessive.

Many practitioners* recommend that the placenta should be separated from its attachment before any attempt is made to replace the uterus. I should myself much prefer acting as just advised, because, should the detachment be effected while the organ remains in its inverted state, either the woman must lose a very great quantity of blood from the patulous orifices of the exposed vessels; or, if such a degree of contraction took place as to stop the hæmorrhage, that very shrinking of the uterine parietes would preclude the possibility of restoring it to its natural state.†

* Puzos traité des Accouch. 4to. 1759, p. 250; Davis, p. 1088; Velpeau, p. 521, &c.; Burns, p. 501. and Dewees, parag. 1309, recommend the uterus to be restored before removing the placenta. Denman, chap. 15, sect. 12, and Blundell, p. 693, that if the placenta be detached to a considerable extent, it should be separated first; if it be entirely adherent, it should be returned with the uterus, and removed afterwards.

† Three cases of inverted uterus have come under my observation. In one I was requested to be present at the inspection of the body of a woman who had died from flooding soon after delivery; we found the uterus completely inverted, and lying in the vagina. The attendant had separated the placenta after the accident, and had contented himself with hiding the organ from sight within the external parts. The second was some weeks after delivery. The uterus was contracted to its small unimpregnated size,—almost as well, indeed, as though it was *in situ;* but the patient was draining to death with a copious fœtid discharge. The last patient I saw about twelve hours after the accident had happened, on July 20th, 1839: she had lost a large quantity of blood, and was much depressed. I made an attempt to revert the uterus without, however, much hope of succeeding. She suffered from irregular hæmorrhage to a most copious extent, with occasional severe pain in the lumbar region, so as to reduce her to a state of extreme danger, and confine her entirely to the house till the middle of October, when she was able to go out two or three times; she then had no hæmorrhage, but a copious glairy leucorrhœal discharge, and violent bearing down pains. Towards the end of December

Errors liable to be committed.—The errors, then, that the inexperienced practitioner is liable to commit in a case of adherent placenta, are many. He may pull too violently at the cord, and cause rupture of the placenta, rupture of the cord, or inversion of the uterus. He may be too fond of removing the placenta by the introduction of the hand soon after the birth of the child. He may also—but of this there is less danger—delay extracting it until it be too late, when the patient having fainted frequently, lies gasping and tossing about, and is cold in the limbs, and a cold sweat breaks out on the upper part of her person. He may use too much force in introducing the hand, and bruise the vagina or uterus, and too little care in separating the placenta, leaving a greater or less portion behind. He may suppose, because he can feel part of the placenta, that therefore it must be entirely in the vagina; and he may endeavour to remove it by pulling at the mass; he may therefore break it, withdraw half, and allow the remainder to lodge in the uterus, and by its putrefaction to become the occasion of that train of distressing and highly dangerous symptoms which I have just enumerated; or, lastly, he may not pay sufficient attention to the necessity of procuring a thoroughly contracted uterus; he may take away the placenta, and leave that organ in a flaccid state, the cause of a persistence of the bleeding.

Hæmorrhage subsequent to the removal of the placenta.—Even after the placenta has been expelled naturally,—or more frequently after it has

she was again attacked with flooding to a frightful degree, and on its moderating she was removed a short distance from London. I did not see her again till the summer, when I found her health generally rather improved, although the hæmorrhage and leucorrhœa had continued almost incessantly throughout the spring. On June 5th, with the assistance of Mr. Hamilton, of the London Hospital, and Mr. Farrants, the attending apothecary, I placed a ligature round the base of the tumour,—then about the size of a small nonpareil apple,—intending to allow it to remain until the uterus sloughed away. The application gave but little pain: on the next day, however, there was every symptom of violent peritoneal inflammation, ushered in by a rigour that came on three or four hours after the operation; there had not been the least discharge of blood since the application of the ligature. The distress was so great, and the danger appeared so urgent, that it was thought right to remove the ligature, which was done twenty-four hours after it was tied. The pain and other inflammatory symptoms gradually subsided; in a few days she was able to leave her room; she menstruated on July 13th, and has continued to do so regularly every month since, without pain, or the expulsion of coagula; the discharge lasts from two to three days, and is moderate in quantity; she has no leucorrhœa; she has regained her flesh, colour, and appetite; can take a long walk; has no bearing down, nor any difficulty in passing water; she can move and sit without the least inconvenience; her bowels are regular, and she says she enjoys now better health than she has had for some years. Nothing solid has passed from the vagina since the operation. It will be for the consideration of the profession, whether this mode of treating such a case may be resorted to on other similar occasions, without incurring the risks necessarily attendant on allowing the uterus to slough away.

been extracted by the hand, in consequence of atony of the uterine fibres, —(notwithstanding that the labour is said to be terminated so far as the different stages are concerned)—the woman is liable to a continuance of the hæmorrhage, or to a fresh accession, owing to the want of due contraction in the uterine parietes.

Causes.—We shall generally find that this description of case occurs to women of a relaxed habit, and weak muscular fibre—to those who have borne a great many children, or after a lingering or instrumental labour; or in cases where the child's body has been hurriedly extracted after the head is born. Exactly the same causes, indeed, will produce this state, as would occasion that inertia of which the retention of the placenta itself is the consequence.

Frequently, under these circumstances, the blood escapes externally; at other times it is retained in the uterus. A coagulum forms at the os uteri, and the effect of this plug is obvious; the blood is poured out from the open vessels into the uterine cavity, is prevented flowing forth, but continues accumulating within, sometimes to an amazing extent. The danger, as before remarked, is even greater than when the hæmorrhage is external, both because the case may be overlooked, and because the more the uterus is distended,—the more blood the cavity contains,—the larger do the vessels become, dilating in their calibre in proportion as the womb increases. The organ has been known to acquire a size, after the birth of the child and extraction of the placenta, almost as large as it was previously to the commencement of labour, so that its fundus rises above the umbilicus, and its cavity contains many pints of blood. Notwithstanding this internal accumulation, scarcely a stain, perhaps, appears externally.

Sometimes the uterus contracts tolerably well immediately after delivery, and then again relaxes, contractions alternating with relaxations, until a very considerable quantity of blood having been lost, the patient sinks. It is on this account that I have more than once recommended that the uterine tumour should be examined, by the hand applied over the abdomen, three or four times within the first hour after delivery; and that the patient should not be left until the attendant is satisfied of the perfect and continued contraction of the organ.

Still another sort of case occurs, which we should scarcely expect,—a dangerous degree of hæmorrhage notwithstanding the uterus is acting powerfully, as evinced by violent after-pains. We lay it down as a principle,—true enough in general,—that the more strongly the womb contracts after delivery, the less danger is there of bleeding; but this proposition only applies to cases where the cavity is empty. If it contain a portion of the placenta, or any other substance, its fibres may act preternaturally strongly, to expel the offending body; and yet, as the cavity is not perfectly

closed, hæmorrhage may go on from the uncontracted vessels. Now, occasionally the coagula which connect within the womb acquire such a degree of tenacity, that they adhere to the internal membrane almost as firmly as the placenta itself under morbid agglutination; and there is nearly the same improbability of their natural expulsion. Under such circumstances, the manual removal of the fibrinous mass, provided it can be accomplished without injury, offers the best chance of safety.*

Of all these three states, that in which the uterus enlarges rapidly, fills with blood, and shows no disposition to contract, is by far the most dangerous.

Symptoms.—We know that hæmorrhage is going on, by the common symptoms which indicate the loss of blood. The colour vanishes from the cheeks and lips; the pulse flags; fainting occurs; the breathing becomes laborious, and drawn with sighs; the extremities lose their warmth; jactitation ensues, and perhaps vomiting. Vomiting, indeed, is not a universal symptom of loss of blood, and seldom comes on until the system is much depressed. Under great exhaustion, I consider it a good sign, rather than a bad one; because it shows that the nervous system is not deadened, but that impressions are still kept up between parts remote from each other, by means of sympathy: and I think, also, that the very effort of vomiting tends sometimes to induce contraction in the uterus, and may thus be the means of preservation.

We know too that the woman is flooding,—if it be external,—by an examination of the linen: sometimes we find a quantity of coagula expelled upon the napkins; at others, that part of the bed in which the woman lies is soaked with blood, and no misapprehension can arise as to the cause of the diminished vital energy. But the hæmorrhage may be internal and concealed; still our means of diagnosis is easy and certain: the simple application of the hand over the uterine tumour will be sufficient to assure us of its state; and by the sensation it conveys, we judge whether blood is pent up within its cavity. If we find the organ large, soft, and flaccid; if it yield to the hand, and become harder when pressure is made upon it, and if then blood passes out of the vagina with a gurgling noise, we can be at no loss to declare the case one of concealed hæmorrhage. But, on the contrary, if the patient continue fainting, while there is no external flow—if we find the uterus as small as a fœtal head, and hard, and observe

* It has happened to me to meet with many cases of this kind, in which, although the uterus was small and tolerably firm, a draining of blood to an alarming extent was going on, while the patient was harassed with almost insufferable after-pains. On the introduction of the hand more or less entirely within the uterus, and the removal of the clots, not only has the discharge ceased, but the painful contractions have also in a great measure disappeared; and almost instantaneous security, as well as ease, has been afforded.

no relaxation in its structure—we must seek some other cause for the symptoms of depression, besides loss of blood:—the syncope is independent of hæmorrhage from the womb.

Treatment.—Under hæmorrhages after the expulsion of the placenta, our indication is to evacuate the uterus so as to ensure the closure of its cavity; and, if necessary, to rouse the flagging powers by the judicious use of stimuli. Both outward applications, internal remedies, and manual operations, will assist us in the accomplishment of our purpose. Pressure, and the application of cold, will often of themselves prove sufficient to restrain the flow, and they may be used in combination.

Called, then, to a case of this description, the first means to be employed is the grasping pressure of the hand to the uterine tumour itself. It is not enough merely to lay the open palm upon the abdomen, and press steadily and flatly; but a squeezing or *kneading* action should be used, by which the organ is prevented filling and becoming distended with blood, and its fibres also are stimulated, to contract. It is not unlikely that the patient may complain of the pain we are putting her to; she may be desirous that our hand should be removed. If the pain she experiences, however, be that of contraction, her entreaties must be disregarded; because upon contraction alone her ultimate safety will depend. At other times she will not allow us to leave her for a single minute; she feels so much comfort from the pressure of the hand and from the support which the abdominal contents receive, and she experiences such a sensation of sinking when that pressure is removed, that she feels convinced she will faint if it be omitted. While hæmorrhage is going on with any activity, I place no reliance on a bandage, however tight it may be drawn, or with whatever local compresses its action may be aided. I cannot think any folds of linen applied over the uterine region, can secure contraction in a manner at all to be compared to the grasping pressure of the hand.

We have proof, indeed, that even the pressure of the hand will not always produce the desired effect: but other means are in our power, efficacious and of easy application; and of these, cold may next be resorted to. A napkin, soaked in vinegar and water, may be suddenly laid upon the hypogastric region, and the uterus will often answer the stimulus immediately. A succession of cold cloths may be used in this way, so as to keep the temperature of this part of the person below the standard, and pressure may be used occasionally at the same time. Should the bleeding, however, still continue, and the faintness increase rather than diminish, the means I next adopt (and sometimes this is much more useful than any other mode of applying cold) is dashing a quantity of cold water upon the lower part of the denuded abdomen. This may, perhaps, appear a rough, and neither a very refined nor very delicate mode of treatment;

but the case is of a highly dangerous character, and all other considerations must give way to ensuring the patient's safety. It is an universal observation, that a slight degree of cold applied suddenly and with a shock, will produce a greater effect than a more intense one continued for some time. Thus Gooch* gives us an instance in which the uterus was stimulated to contract by a quantity of cold water, thrown suddenly from an ewer on the abdomen, although it had not answered to the application of ice, which had been used previously for a considerable period.

We may, however, still be foiled, and must resort to other measures. The introduction of the hand into the uterine cavity may next be put in practice, and it seldom fails in producing the contraction we desire. The student may be inclined to inquire, then, why we should not introduce the hand immediately the hæmorrhage becomes alarming?—Because it is better first to adopt less harsh means. The introduction of the hand is always to be avoided, if, by any other method, we can produce the same measure of good, without the chance of injury: but yet there are many states that fully warrant even this proceeding. The coat must be taken off, the left hand and arm greased, and passed gently into the uterus, and the parietes may be stimulated by the fingers moved within it; at the same time that the right hand grasps it externally; or, as Gooch† recommends, the bleeding vessels may be compressed with the knuckles within, while the uterine tumour is pressed upon without; and by this combination of external and internal pressure, it is seldom that we shall not succeed in putting a stop to the discharge. If there be any fibrinous coagula adhering to the internal membrane, these must be removed as cautiously as we should separate the placenta.

Some cases, however, will not yield even to this mode of treatment, and other expedients are recommended—such as injecting a quantity of iced water, vinegar, or other astringents, into the uterus itself;‡ which mode of practice, however, I should fear might be likely to induce inflammation of the uterine tissue, or of its veins. Ice§ has also sometimes been introduced into the vagina with advantage, either naked, or wrapped in linen or flannel; before being passed into the cavity it should be held in the hand till the corners are rounded off. Again: it has been recommended that we should stuff the vagina, or even the uterus, with cloths steeped in any astringents at hand.‖ To such an application, under such circumstances, I have already objected; because the blood is not preserved in

* Compendium, by Skinner, page 168. † Op. Cit., page 164.

‡ Saxtorph; "New Method of Treating Hæmorrhages after Labour." Pasta, in extreme cases, advises the injection of alcohol, or dilute sulphuric or nitric acid.—(Gardien, vol. iii. p. 230.)

§ Blundell, p. 466; Gooch, p. 167. ‖ See Gooch, p. 168.

the woman's vessels by filling either the vagina or the uterus; it is escaping through their orifices, and collecting in the uterine cavity; and as the womb, by the presence of the plug, is prevented contracting, the very object which we wish to gain is defeated by our own anxious care. Compression of the aorta has lately been much extolled by Baudelocque, who claims the credit of the suggestion.* There is not much difficulty in moderating the flow of blood through this vessel in most women after delivery, especially if they be of spare habit, owing to the lax state of the abdominal muscles; and in some cases of after hæmorrhage, this proceeding may be attended with fortunate results. Dr. Rigby† thinks the application of the child to the mother's breast the most efficacious means of procuring uterine contraction in this species of hæmorrhage. He grounds his opinion upon the sympathy which exists between the two organs, and the known fact of the action of sucking very generally inducing after-pains. If the trial can be made, without disturbing the patient much, I see no objection to its adoption.

Of remedies acting through the agency of the stomach, stimuli, (domestic or medicated,) opium, the acids, and the ergot, are the chief in use. The cautions respecting the use of spirits, ammonia, and other substances which powerfully excite the arterial system, I need not here repeat. They are only admissible—as long as there is a chance of hæmorrhage continuing—when the powers are sunk so low that there is immediate and imminent danger present. I have stated that opium, in large doses, is very much extolled in cases of flooding, especially by Professor Burns, and Dr. Stewart, but that I consider it a medicine inadmissible unless the uterus have entirely contracted, when the danger of fresh bleeding has gone by.‡ Opium certainly acts as a cordial, lulling the irritability of the patient, and producing a sleep, or at any rate a composing stupor; but it also takes off both muscular and uterine action: it disables the uterus, therefore, from contracting, even were it so disposed; and if the proposition be true, that on the contraction of the uterus alone we are to rely for the patient's ultimate safety, it cannot but appear contradictory to resort to a medicine whose very action tends to prevent the effect desired. It has been objected, that although opium, in small quantities,

* Mem. de l'Academie des Sciences, January, 1835. Although this might have been an original thought of Baudelocque, the practice had been pursued ten years before by Ulsamer, (see Lancet, July 20th, 1839;) and I myself had employed it long before Baudelocque's memoir was published. A proposal to the same effect, by Trehan, will be found in vol. xxxiii. of the Journal Compl. du Dict. des Sciences Méd., p. 367.

† Med. Gazette, vol. xiii. p. 785, and vol. xiv. p. 335. He gives cases in illustration; and states that his attention was first drawn to the subject by an observation in Professor Carus's *Gynäkologie*.

‡ Page 347.

takes away uterine action, yet, in large doses, it produces the very opposite result, and excites contraction. This proposition is at variance with common sense, with all analogy of the actions of other drugs, and at least with my experience. I have often seen, at the commencement of labour, uterine action suspended by what would be considered a large dose of opium; and if the same quantity will take away action at the beginning of the process, is it reasonable to suppose it will excite it at the termination?—But it may be said the experience of practitioners of eminence proves the value of opium in the case under consideration; and that there is no reasoning against experience. I by no means deny that many patients have done well after the administration of large doses of opium; but that circumstance does not prove that the drug was the agent of their preservation. I should be inclined to attribute the recovery to other causes, independently of the exhibition of the medicine. I strongly recommend opium in large doses and the solid form, in those cases of irritability produced by a loss of blood which had previously taken place; but that only when the uterus is contracted and the danger from flooding is past.

We should act unwisely to trust much to any of the mineral acids in these dangerous cases, but they may be resorted to in combination with the use of other means, and generally act as grateful refrigerants. The ergot seems to be indicated, as the grand object is to produce uterine contraction: it may be combined with an acid. I have witnessed many cases of after-hæmorrhage, in which it appeared to have been given with decided advantage.

Transfusion.—Our last resource is the transfusion of blood into the system of the dying patient,—a means deemed by some most powerful in arresting the vital spirit, even as it flutters with tremulous delay upon the lip. To Dr. Blundell is due the merit of having restored the practice, of advocating its adoption with all the force of his powerful mind, and proving its efficacy both by reasoning and experiment. But transfusion can be of little use, unless contraction have taken place in the uterine parietes. It is evident that, while the vessel remains patulous, the more we excite the arterial system, the more likely is the flooding to continue, as is demonstrated in the use of the ordinary stimulants. If, then, by infusing blood while the uterine structure remains flaccid, we cause the heart to beat more forcibly, the fluid will again exude through the open vessels;—and we might inject *ad infinitum*,—the arteries emptying themselves as the veins become distended. But the case is very different when we have closed the vessels through which the blood escapes; it is then retained in the body, forms a part of the circulating current, revives the patient by its action on the brain, and restores her from temporary death

to life. I would restrict the practice of transfusion, then, to those cases in which there is no chance of the blood again escaping;* and I think it would be most useful when the placenta has been removed—when the uterus has contracted—when the hæmorrhage that had caused the depression has ceased—but when the patient remains fainting and in danger, unable to be roused by stimuli taken into the stomach, and without a well-grounded hope of restoration being effected by her own proper powers.

In such cases I have little doubt that transfusion may be most valuable; but if it becomes a common practice, I am persuaded it will often be employed unnecessarily. This opinion I form from having seen many women recover without any blood being transfused into their system, who seemed scarcely to have a chance of life. If in these cases the means under consideration had been used, the credit of the recovery would have been given to the operation, and strong arguments might have been adduced in favour of the propriety of the measure.†

It is astonishing how tenacious of life some systems appear under uterine hæmorrhage, and how easily others will let it glide away. The necessity, then, of such means in any particular case, will be a question of the greatest nicety. If employed while hæmorrhage is going on actively, it will be useless; if delayed until the breathing has quite ceased, it cannot be expected to be followed by restoration; if commonly practised, it will many times be resorted to unnecessarily.

Mode of performing transfusion.—Blundell,‡ with much ingenuity, has contrived an instrument, named by him *the impellor*, by which the blood may be at once transfused from one system to the other, without being obliged to stagnate in a vessel; but as this is rather a cumbrous machine, and difficult to adjust, and especially as the same enlightened physiologist has proved beyond dispute that the vital fluid loses little or none of its valuable properties by being collected in a cup, absorbed by a syringe, and afterwards injected,—provided no time be unnecessarily wasted,—I shall merely describe the readiest mode of performing the operation by a common syringe. The instrument should be of brass, tinned inside capable of containing between two and three ounces, perfectly air-tight, and clean from oil.§ One or two persons,—males in preference to females,

* An exception should be made in favour of placental presentations, as mentioned at page 347.

† See Hamilton, p. 339; Davis, p. 1066; and Velpeau, edit, Brux. p. 494.

‡ Physiol. and Patholog. Researches, 1824.

§ A very simple and ingeniously contrived syringe for the purpose of this operation will be found described and depicted in Waller's edition of Denman; also in the Lancet for Oct. 31, 1840, where there is a highly valuable case, and some judicious remarks by Mr. Lane. I

from their less liability to faint,—being in readiness to supply the blood, one of the patient's veins at the bend of the elbow must be laid bare to the extent of an inch, and divested of its cellular web; an aperture must then be made into it of rather more than a line in length. The blood must be drawn from one of the bystanders in a full stream; about three ounces must be received into a conical cup or tumbler, and absorbed as soon as it is collected: the nozzle of the syringe must be raised perpendicularly, and the piston slowly propelled upwards, to expel any air that might have passed into the instrument: its point must afterwards be inserted in the aperture formed in the vein, and the blood slowly propelled towards the heart. No ligature need be put upon the patient's arm below the wound; but the vein may be secured by passing a blunt-pointed probe entirely under it, having dissected it away from its surrounding attachments; and this particularly, lest blood should escape from the incision, and embarrass the operator. The chief delicacy of the operation consists in regulating the quantity used, and in adjusting the velocity, with which it is injected, to the diminished power of the arterial system. If we throw it in with too much force, we may choke the heart, and death will be the consequence: if, on the other hand, we are too tardy in our operations, the blood may partially coagulate, and be rendered unfit for the purposes of life. We may inject a second, third, and fourth syringe full, deliberately watching, between each, the effect produced. Twelve or fourteen ounces will most probably, at the highest average, be sufficient, if any advantage is to result from our endeavours: for, since we know that, although a patient will sometimes bear a large loss of blood with comparative impunity, the additional loss of a very few ounces more may irrecoverably depress her, so we may reasonably infer that a small quantity added to the system, after a great diminution has been sustained, will be sufficient to raise it to the necessary point;—unless, indeed, the nervous energy be too much sunk to be roused by any means that human ingenuity could devise.

I have directed, that if *transfusion* appear necessary, human blood should be used for the purpose; and this recommendation is founded on experiments first, in modern times, performed by Dr. Leacock, of Barbadoes, and made known through the medium of his inaugural thesis, printed in Edinburgh in 1817; and afterwards frequently repeated and varied by Dr. Blundell.* These experiments prove that the blood of one

have not thought it necessary to give a delineation of this instrument, nor to point out the mode of using it, as that copy of Denman is well known, and as I presume the talented periodical I have referred to is in the hands of, or at least accessible to, every practitioner.

* Op. Cit., p. 81, et seq. Leacock, in his experiments on the dog, used sheep's blood; Blundell that of the human subject.

genus of animals is unfit to carry on the functions of life, when injected in any considerable quantity, into the system of an individual of another genus. If human blood, or that of sheep, for instance, be injected into the veins of a dog, after the animal has been bled to syncope, resuscitation for a time occurs; but it is not lasting—the powers soon begin to droop, and after a period, varying from a few minutes to some hours or days of languid existence, death takes place. Thus, then, we must never think of employing, for the purpose in question, any other blood than that derived from the human subject.

Management of a patient after dangerous hæmorrhage.—When a woman has suffered hæmorrhage to any dangerous extent, although the uterus may have become firmly contracted, and, to her own feelings, she is comparatively comfortable, yet she must by no means be considered safe for many hours; because the organ may again relax, and with a return of the relaxation there may be a return of the bleeding. It behoves us, then, to guard against such a possibility; and the best mode of prevention is to keep her perfectly quiet, to allay irritability, and solicit sleep by a moderately large dose of opium, and to sustain her by a frequent supply of fluid nourishment in small quantities. Strict injunctions must consequently be given that she should not be moved for many hours. In ordinary cases, after labour we require that an hour and a half, or two hours, should elapse before the patient is placed in bed in the position she is to retain, and her linen changed; but after hæmorrhage, we shall frequently find it necessary to keep her in the same position for eight, ten, or twelve hours, or even longer. A bandage may be applied, but beyond that no alteration should be made in her person. Many cases are on record, where a patient, having suffered hæmorrhage, has been placed in a sitting posture, for the purpose of having her person made more comfortable, and has fallen down dead upon the bed; others, where moving from one side of the bed to the other has produced syncope, and even death; and some, where the same fatal consequence has followed the slight exertion of raising the head above the level of the shoulders: so that we cannot be too cautious in allowing the least disturbance. The room may be darkened and well ventilated; opium may be given, with a little stimuli, if necessary; and such nutrient fluids as are most easy of digestion, should be exhibited at regular and short intervals.

Effects of the loss of blood.—There are many distressing symptoms consequent on the loss of blood, independently of fainting. Some of these appear soon, and are comparatively evanescent; others do not occur for some time, being more remote, but more permanent. Of the latter kind are cachexia, wastings, purgings, dyspepsia, dropsies,—especially an œdematous state of the legs and feet. Such affections are to be attributed

to the balance of the circulation being destroyed, by the sudden abstraction of so much blood from the circulating system.

The loss of blood will sometimes excite dormant morbid actions, which may terminate in organic disease, where there is a predisposition to its formation. I have seen two cases in which phthisis itself seemed to be called forth, in its direst form, as a consequence of violent hæmorrhage, no symptoms of diseased lungs having previously existed.

The loss of tone in the system generally, is best relieved by sending the patient into the country, to the sea side, or some chalybeate spring, enjoining regular hours, regular exercise, regular nourishing diet, with gentle stimuli and tonic medicines,—provided there be no local affections, or any contra-indicating symptoms. Œdema of the legs will most likely disappear spontaneously; if an accumulation of water take place in the abdominal cavity, diuretics or elaterium may procure its removal, or an operation may be required. The purgings produced by an irritable state of the mucous membrane, so frequent as a consequence of a copious loss of blood, may be relieved by chalk, opium, rice, and nourishing diet. The aphthous state of the mouth accompanying the purgings will also often yield to the same treatment. Both these symptoms, however, are most likely to be alleviated by sending the woman into a purer air. It is commonly observed by practitioners in crowded cities, that the diarrhœa has subsided immediately on removal, although it had not given way in the least degree to the exhibition of the most approved medicines.

Re-action after flooding.—The symptoms which appear immediately after flooding, when the first effects of fainting are gone off, are those of re-action and nervous irritability in an extreme degree. When the system is deprived of a large quantity of blood, the circulation is carried on in a much more rapid manner, that the increased velocity may compensate for the diminution in quantity; and in proportion as the quantity is diminished, will the velocity be increased.

This re-action is attended with fever; quick, small, sharp, jerking, and sometimes a wiry, at others a compressible pulse; increased heat and dryness of skin; shrivelled features; dryness of the mouth, and a parched and pinched state of the nose and lips; a diminution in all the secretions; desire for fluid, and dislike to solid food; intolerance of light and sound; inability to sleep, and most distressing pain in the head. Palpitations are often present; so also are panting, dyspnœa, and a degree of hurry and alarm on waking from a doze, or being suddenly disturbed.

The pain in the head is almost universal after hæmorrhage, and is very characteristic. It is described as being similar to the thumping of a small hammer within the skull, or the ticking of a clock; sometimes, but more rarely, it resembles the roaring of the sea, or singing of a kettle. Every

movement of the head is attended with great uneasiness; and if raised from the pillow, a sense of fainting supervenes. I have little doubt that this sensation of thumping arises from the column of blood being lessened in diameter, and the arteries not being sufficiently distended by their contents. As these vessels are highly elastic, their calibre contracts in proportion to the decreased quantity of blood that they contain. When they are fully filled, and their coats are duly distended, they propel the blood onward with but slight effort; but when partially emptied, so that the natural and healthy agreement between their capacities and the measure of their contents is disturbed, they are compelled to beat violently, in order to carry on the circulation; and this forcible contraction propagates an increased jerk to the fluid. Most probably this state pervades the whole body; but it is only perceived in the brain, in consequence of the structure and peculiar sensibility of that tender organ.*

Treatment.—If we bear in mind that the cause of the distressing symptoms is referable to the decreased quantity of blood circulating, and its augmented velocity, dependent on the diminution in its quantity, we shall never be much at a loss in directing our treatment. Our object is to diminish the present irritability—to alleviate the febrile symptoms—to remove the distracting headach—to preserve as much as possible the remaining power—and gradually to add to the mass of circulating fluid.

With the latter view, nutritious diet must be frequently administered;—sago, arrowroot, milk, jelly, and strong broths, in as large a quantity as the stomach will digest. To diminish the irritability of the system, and moderate excessive action, saline medicines may be given, either in effervescence or not; cold sponging may be employed to the hands, arms, and

* This beating pain is so very general, that we may often at once commend ourselves to the confidence of our patient, by the pertinence of our questions regarding it. There is nothing in the whole range of the practice of medicine which attracts the attention of a patient so much, or so forcibly convinces him that his physician understands the nature of the disease under which he labours, as an accurate description of the painful sensations he is suffering. For our own sake, then, as well as his, it is desirable in our general conduct at the side of a sick-bed, that we should habituate ourselves not to hurl a number of random questions at the patient, but only to put such as appear pertinent to the case, and are likely at once to strike his notice. The confidence of the sick, indeed, is a heavy weapon in the hands of his physician; it is sometimes more serviceable than the whole combined armament of the Materia Medica. These observations apply eminently to the case under consideration. If we see a woman blanched, with her skin of a waxen paleness; if we find a jerking, bounding, hæmorrhagic pulse, and learn that a few days before she has suffered a large loss of blood, we may be almost assured that this peculiar pain in the head is present. The simple inquiry, then, addressed to her, "Whether she is not suffering under a violent beating, like that of a small hammer, within the skull?" will often of itself be sufficient to inspire her with confidence.

face; and opium may be prescribed in tolerably large doses. Both the mental and corporeal irritability produced by a loss of blood, is better alleviated by opium than any other remedy: and although as a principle we avoid opium when much headach is present, in this particular affection the drug, either alone, or combined with salines or ipecacuanha, will often be found most serviceable. Nevertheless, it is not to be expected that any medical means will *rapidly* remove the cerebral distress; but it will generally be observed, that as fresh blood is formed by the assimilation of nourishment, all the symptoms will gradually subside. I cannot help thinking, indeed, that if no medical treatment, beyond proper attention to the bowels, were employed—if nothing were exhibited but mild nourishment in small quantities, at regular intervals, the symptoms would of themselves disappear; and I am persuaded, that in no few instances medical interference has been of decided injury.

I would caution the student against using any means which are likely to diminish the quantity of blood circulating in the system; and therefore all powerful evacuant remedies must be avoided, particularly bleeding. Generally nothing can be more injurious than the bold use of the lancet under this state of reaction, consequent on the loss of blood; and no treatment can be more unphilosophical; and yet I have known venesection repeatedly resorted to. Taking blood, indeed, will for a time almost always relieve the pain; but the alleviation is merely temporary, it only remains as long as the patient continues faint; reaction soon occurs in a still greater degree than before, and an aggravation of the symptoms is the consequence. It is not reasonable to suppose that this peculiar headach arises from undue determination of blood to the brain; but more probable that it is produced rather by the vessels being too empty. For this reason, also, I should avoid leeching and blistering the head, or its neighbourhood. If, indeed, instead of a pale exsanguined countenance,—which is almost invariably present,—there should be a turgid and suffused face, indicating an extraordinary fulness of the veins of the skin, I should presume the same state to have taken place within the skull, and should then apply leeches pretty freely, or use other means to relieve the surcharged vessels. I should object also to violent purging; for I think I have seen two or three instances where this practice appeared to aggravate the symptoms. It is certainly proper to take care that the lower part of the intestinal canal should thoroughly empty itself daily, but not to keep up by medicine such a constant irritation on the mucous membrane as will produce a very much increased secretion, and a copious drain from the system generally. A slight purgative may be given every day, more with the view of stimulating the sluggish action of the intestines, than of procuring a number of watery stools.

Cold applications to the head, and especially ice, will often relieve the pain in a great degree during the time they are being used; but it returns when they cease to be applied. There cannot exist any objection to the application of cold; it must do good if it can bring freedom from suffering; and it can produce no injurious effects subsequently, as powerful evacuants may do.*

We shall be most successful, then, by avoiding powerful evacuants, yet regulating the bowels daily, by the exhibition of saline medicines and Dover's powder, or small doses of ammonia with hyoscyamus, by the application of cold to the head, by sponging the face, arms, and hands, with vinegar or cold water,—provided there be increased heat of skin,—by admitting fresh air, enjoining perfect quiet, soothing irritability, soliciting sleep, and by a frequent supply of mild fluid, and nutritive food.

2d. LABOURS COMPLICATED WITH CONVULSIONS.

An attack of puerperal convulsions is one of the most frightful accidents that can happen to a patient under labour.

A convulsive paroxysm during labour may occur under two extreme states of system diametrically opposed to each other; the one, in which the cerebral vessels are inordinately distended with blood; and the other, when they have been drained almost empty, as in the case of excessive hæmorrhage: and it is a curious fact, that the two perfectly opposite states, viz. too great a fulness of the vessels, and too great emptiness, will produce, in this respect, exactly the same phenomena.†

I have already mentioned, that the occurrence of a convulsive seizure, in a patient who has suffered violent hæmorrhage, is to be regarded as a

* The young practitioner may consult with great advantage Dr. Marshal Hall's Treatise on the Effects of Loss of Blood: the profession is much indebted to him for his means of diagnosis between the affections of the different viscera, particularly the heart and brain, produced by excessive depletion, and somewhat similar symptoms the result of inflammatory action.

† It is almost universally observed, that when an animal is bled to death, the last act of life is a most violent convulsion of the voluntary muscles. Andral says, "In at attack of convulsions, the brain is equally effected by an over-abundant, or too sparing a flow of blood to the head." (Med. Gazette, vol. xiii. p. 106.) Some pathologists, indeed, have regarded it as "improbable that any state of things should materially augment or diminish the actual amount of fluids within the cranium," in consequence of the brain being perfectly enclosed within a bony case, and removed from the influence of atmospheric pressure.—(Reviewer of Abercrombie's work on the Brain. Med. Chirurg. Review, vol. ix. p. 85.) The talented author just mentioned seems to entertain the same view. So also Clutterbuck, (Cyclop. of Prac. Med., vol. i. p. 125, art. Cerebral Apoplexy.) I am inclined to think, that when hæmorrhage to any extent takes place, the cerebral vessels participate, in no small degree, in the general inanition of the circulatory system.

highly dangerous, and frequently a mortal symptom. Such cases, however, are not to be looked upon as true puerperal convulsions: this term should be restricted to the disease next to be described.

Period at which they occur.—The true puerperal convulsions may occur at any period of the latter half of pregnancy, or in any stage of labour; they not unusually first make their attack many hours even after the child is born, and the placenta expelled; when the process is popularly considered as completed. We generally meet with them, however, during the last few weeks of utero-gestation, or the first stage of labour, previously to the entire dilatation of the os uteri. At other times, but more rarely, they occur when the head is pressing on the outlet of the pelvis, and distending the perineum—when the uterus has been acting excessively strongly, and the labour is somewhat lingering. The great bodily exertion consequent on the parturient efforts may, in such a case, have much influence in their production. Occasionally, indeed, convulsions appear early in pregnancy; and Perfect gives us two cases* in which they attacked the patient before quickening.

Universal liability to them.—These convulsions may assail women of all ages, and of all kinds of constitution; women with their first child, as well as those who have borne many; but they by far most frequently accompany first labours;†—and the kind of patient most obnoxious to their attack is the stout, florid, robust woman, of strong muscular fibre, with a thick set form, and short thick neck—just such a person as would be considered predisposed to apoplexy. But the most delicate and slim female is by no means exempt from the danger of a convulsive seizure. There is little doubt that a naturally excessive sensitiveness of the nervous sys-

* Cases in Midwifery, XLV. and XLVI.

† Women in their first pregnancy, and those who carry more than one infant in utero, are most liable to convulsions, (Hamilton, Pract. Obs., p. 356. See also Denman, chap. xvi. sect. 2,) &c. Out of 19 cases recorded by Dr. Joseph Clarke, 16 were first births. (Collins, p. 200 note.) Of 36 by Merriman, 28 were first births, (p. 141.) Of 30 by Collins, 29 were first births, (p. 200.) Of 26 by my father, (part 2,) in four no mention is made as to whether they were first pregnancies; but of the 22 remaining, 15 were so; three were not, the women being at full time; four were not, the births being under seven months. These cases were selected by him out of a great number, either because of their dangerous symptoms, or to exemplify some point of practice, without reference to their being first or subsequent births. Of 59 cases which I have myself attended, 17 occurred before labour was instituted, 28 during the process, and 14 after its termination. There were three cases of twins: 45 were first births; 13 of the women died; of the children, 41 were expelled naturally by the head; 6 were delivered by craniotomy; 6 by the forceps; 5 by turning; and 4 presented with the breech; 23 of these only were born alive, and of these cases, in 12 the convulsions took place after delivery. One patient was attacked nine days after labour, another ten, a third seven; the convulsions ceased for a week; she then had another series of fits, of which she died; and a fourth 18 days subsequently. This is the longest period I have known intervene between the birth, and an accession of this dangerous disease.

tem may predispose to the disease; and I have traced an attack, more than once, to originate from mental emotion, particularly grief, despondency, or other depressing passions.

Analogy to apoplexy and epilepsy.—Puerperal convulsions are more allied to apoplexy than any other disease of the body, inasmuch as they usually depend upon exactly the same causes. There is also an analogy in respect to the stertor and stupor, which form prominent features in both diseases. They would likewise seem to bear some resemblance to epilepsy from the violent spasmodic paroxysms which constitute the most striking symptom of puerperal convulsions. The disease is unlike apoplexy, however, because in common apoplexy we seldom have the convulsive fits, and seldom or never is permanent paralysis produced as a consequence of puerperal convulsions.*

Again, it is seldom that in epilepsy the convulsive paroxysms follow each other so rapidly as they do under an attack of the disease we are now considering; but they have a tendency to return at different periods throughout the whole or a considerable portion of life. This latter observation, however, does not apply to puerperal convulsions; nor is there any *aura epileptica* observable in this affection. Upon the whole, it appears to me that the convulsions of the puerperal state bear much more resemblance to apoplexy than to epilepsy, because they are produced by exactly similar causes,—those causes, indeed, acting on the system under peculiar circumstances,—and because they are relieved by exactly the same means.

I look upon a case of puerperal convulsions to be, in fact, one of apoplexy, only that we have superadded to the common apoplectic phenomena violent spasmodic contractions;† and this symptom is dependent upon the irritable and excitable state of the nervous system always in a greater or less degree accompanying pregnancy and parturition. We can readily imagine that in a highly excitable state of the nervous system, any irritation which the brain might suffer would be more likely to produce convul-

* However desirable and proper it may be, for the purpose of carrying on a system of minute nosological arrangement, to divide puerperal convulsion into different species—such as tetanic, cataleptic, hysteric, epileptic, apoplectic, &c.—it appears to me that such a mode of treating the subject tends only to confuse the student, and divert his mind from the chief object to which it should be directed,—the value of the various curative means which we have it in our power to apply. Dewees classes them under three heads, the *epileptic*, *apoplectic*, and *hysteric*. Baudelocque arranges them under the titles of *tetanus*, *epilepsy*, and *catalepsy*. Merriman styles them *dystocia epileptica*; while Velpeau and Desormeau prefer the general term *eclampsia*.

† "When a woman in labour is seized with convulsions, attended with stertor, frothing at the mouth, lethargy, or total insensibility, she may be considered as suffering an apoplectic paroxysm." (Bland on Human and Comparative Parturition, 1794, p. 138.) "When a state of coma and stertorous breathing prevails, the disease assumes the semblance of apoplexy." (Ramsbotham's Pract. Obs., part ii. p. 247.)

sive action of the muscles than the coma attendant on apoplexy; and this opinion is borne out by our observations on infants.

In infancy, as anatomical investigations demonstrate, the nervous system bears a very large proportion to the general bulk of the body; and we may presume that its influence on the body generally is in proportion to its development. Now, we very rarely see such a disease as the apoplexy of adult age in an infant; but when the brain is irritated by pressure or other causes, convulsive paroxysms are excited. I consider, then, the case of puerperal convulsions to be exactly analagous to that of infantile convulsions, and that they are both of them allied to apoplexy; the causes, however, acting upon the system under a highly excitable state. This view of the case, whether correct or not, is practically valuable, and will lead to the most judicious treatment. It was the want of tracing this analogy between puerperal convulsions and apoplexy that introduced the destructive practice until late years so universally adopted.

Atmospheric influence.—I have remarked that puerperal convulsions are much more frequent in hot weather than in cold, and especially at times when the atmosphere is charged with electricity. Thus, they are oftener met with towards the end of summer and in the autumn, or in the spring, when a few unusually warm days have suddenly burst upon us. My father many years since called my attention to the fact of convulsions being more frequent when (to use a common expression) there was "thunder in the air," than at any other time; and he has pointedly mentioned such a conviction in the second part of his work.* Andral† has more recently stated his opinion to the same effect, when speaking of convulsions in general. "The electrical state of the air on the approach of a storm has often served to bring on a convulsive fit." And Denman‡ remarks, —"It has been justly observed, that women are far more liable to puerperal convulsions in certain years and seasons than in others;" and he then proceeds to enumerate, among other causes, "the particular influence of the air." Nor did this circumstance escape the acute Smellie; for he states, that in the course of the year 1747 he attended several patients who were attacked near their full time with convulsions; that other practitioners also saw similar cases during the same time, "so that they seem to have proceeded from the constitution of the weather."§ Whether this liability, indeed, merely arises from women not being able to bear the fatigue of labour as well in hot weather as in cold, or from the blood being then more rarified —or whether it be that such kind of weather exerts some specific influence over the system, particularly of puerperal women, which predisposes to these convulsive attacks,—I cannot pretend to determine; but I suspect

* Pract. Obs., p. 248.
† Op. et loc. cit.
‡ Introduction to Midwifery, chap. xvi. sect. 2.
§ Mid. 1799, vol. ii. p. 285.

that the peculiar effect is principally to be attributed to the atmosphere being highly charged with electric fluid.

Proximate cause.—The most usual proximate cause of puerperal convulsions is probably pressure on the brain; this pressure being sometimes produced by the rupture of a vessel, causing a sudden effusion of blood; sometimes by serous exudation into the ventricles, or between the membranes; sometimes,—and by far the most frequently,—by simple congestion of the cerebral vessels themselves. But the disease has often proved fatal without any organic lesion being evident on dissection, and without even the vessels being observed to be preternaturally full.* In this respect, also, there appears a strong analogy between apoplexy and puerperal convulsions; for Zuliani, of Brescia, in 1780;† Kortum, of Dortmund, in 1785;‡ and, more recently, Abernethy, among us, have recognised a species of apoplexy, to which the term *nervous* has been given. In two cases, also, related by Abercrombie,§ of his *simple apoplexy*, no anormal appearance was observed after death.

Remote causes.—Into the remote causes it is not my wish to enter at any length, because the subject is at best but unsatisfactory, and little understood. They have been ascribed to articles of food remaining undigested on the stomach, or irritation existing in some other part of the alimentary tube;—to general irritability of constitution;—to a delicate and luxurious mode of living;—to the depressing passions;—to an overloaded state of the system;—to over-distention of the uterus;—to distention of the bladder; and to the death of the child. But the affection, in my opinion, originates most frequently in some deranged state of the uterus itself, probably in its nervous system, and consists in some irritation propagated from that organ to the brain.‖

* See my father's Pract. Obs., part ii. p. 248.

† F. Zuliani de Apoplexia, præsertim Nervea. Lipsiæ, 1780.

‡ Car. G. Theod, Kortum de Apoplexia Nervosa. Gott. 1785; apud Ludwig, tom. iv.

§ Diseases of the Brain and Spinal Chord, 1828.

‖ I have met with three or four cases which have strongly impressed me with the idea advanced in the text, the most striking of which is the following:—I was called, some years ago, by one of the midwives of the Royal Maternity Charity, to the assistance of a woman under puerperal convulsions. When I arrived I found she had been bled largely by a medical friend living in the neighbourhood, who had been sent for on the instant of the attack. The bleeding had relieved her partially, but it was thought right to repeat it. A third quantity of blood was taken some time after, with such a beneficial effect that the convulsions entirely ceased, and, in a few hours, perfect consciousness had gradually returned. About fifty hours after the attack, active labour came on; and in less than five hours more the child was born, dead. The placenta did not descend, and two hours subsequent to the expulsion of the child I was summoned. I found her perfectly sensible, in good spirits, and she made no complaint. There had been no hæmorrhage, the uterus was not strongly contracted, and the placenta entirely within it. Under no greater anxiety than I usually feel, when the placenta is retained, I proceeded in the ordinary way to remove it. The moment I had

Symptoms.—The symptoms of puerperal convulsions are so prominent and strong, that if once the disease has been seen, there is no likelihood of its being mistaken. If they occur, as is usually the case, during the first stage of labour, the patient is probably sitting or walking; she may be even occasionally joining in conversation; and, without giving any previous warning, suddenly falls down in a strong fit. All the voluntary muscles of the body are thrown into a state of violent spasms, alternating with relaxation, so as to produce rapid and powerful contortions and struggles; the fore-arms and legs, but particularly the former, are jerked backwards and forwards with great rapidity; and the strength of two or three assistants is required to restrain the patient. The face becomes turgid and livid, swollen by the increased quantity of blood with which the vessels are loaded. The throat also seems to swell, the carotids beat inordinately, and the jugular veins appear prominent. The countenance assumes a most hideous expression, partly from the suffused state of the

passed my hand completely into the uterine cavity the patient turned upon her abdomen, and, without uttering any expression of pain, went into a convulsion, though not of a violent kind; intense coma supervened, which yielded to no treatment I could devise, and terminated fatally in about two hours from the removal of the placenta. The vagina, and especially the inner surface of the uterus, communicated to the hand a more pungent sense of heat than I recollect to have experienced on any other occasion.

About forty-eight hours after her death I made an accurate inspection of the body. The dura mater adhered more firmly than usual to the inner surface of the cranium, but was healthy in appearance; the vessels of the brain contained less blood than ordinary; the plexus choroides were quite blanched; there was no fluid in the lateral ventricles, none between the membranes, at the upper part of the skull, but about two drachms at the base of the brain; no extravasation of blood existed in any part of the cerebral mass. The viscera were all healthy; the uterus was contracted; nor did it present any uncommon appearance.

Here was as clear a case as can possibly be made out of irritation propagated immediately from the uterus to the brain; and I have no question in my own mind, that if the placenta had not unfortunately been adherent, but thrown off naturally, the woman would have recovered perfectly.

Ingleby has related a case almost analogous; the patient, however, not having suffered any convulsion before delivery. "A highly esteemed friend of mine once found it necessary to pass his hand into the uterus for the purpose of removing an adherent placenta, the ergot of rye having been previously administered. The introduction was carefully performed. The straining and opposition to his efforts, on the part of the woman, were exceedingly great; and at the moment when the operator's hand had reached the organ, my own hand making counter-pressure on the abdomen, the patient became violently convulsed, and died in less than a minute."—(On Ut. Hæmor., p. 186.)

The cause of this convulsion could not have been excessive loss of blood, because Ingleby would doubtless have mentioned that fact, if it had been so; besides, if the woman had been faint from hæmorrhage, she could not have so strongly resisted the efforts made to introduce the hand. He, indeed, expressly gives his opinion from the state of the pulse that she died from apoplexy. I look upon this case as one also proving that the remote cause of this kind of convulsion often exists in the uterus, and that the irritation is propagated through the agency of the nervous system to the brain.

features, and partly from their distortion and convulsive action. The eyes seem starting from their sockets; and, in consequence of the spasmodic action of their muscles, are drawn obliquely upwards, one to the inner and the other to the outer canthus; so that none of the pupil, and but a small portion of the cornea, can be seen. The eye-lids are half open, and violently agitated; the pupils themselves (if the eyes can be so opened as to obtain a sight of them) are generally dilated; sometimes, however, more than usually contracted; (or one is preternaturally contracted, while the other is widely dilated;) and I have then observed them expand, in the interval of the fits, on the application of light. The lips partake of the general convulsion. The angle of the mouth is drawn upwards to one or other side, and twitched spasmodically. At the commencement of the fit the lower jaw is depressed and drawn considerably to one side; but the temporal and masseter muscles soon act with amazing strength, and firmly clench the teeth together. The tongue is almost invariably protruded beyond the gums; and the muscles of the jaw contracting powerfully at the same time, catch it between the teeth, and lacerate it dreadfully. A quantity of frothy saliva escapes from the mouth, generally tinged with blood, which issues from the wounded tongue, adding very much to the hideousness of the aspect. The breathing is deep, irregular, and laboured, and performed with a sharp hissing noise, from the air being impeded in its passage, partly by the clenched teeth, and partly by the saliva, which hangs about the lips. The pulse, during the paroxysm, varies, being full, slow, and oppressed, at the commencement and before the attack, and increasing in velocity as the intensity of the fit becomes greater. As these frightful and alarming symptoms occur so suddenly, it is not surprising that they should strike the attendants with terror and dismay. So general and powerful is the alarm, that every one, in the distress of the moment, is running in search of they know not what; and the medical attendant, deprived of the assistance of the bystanders, is often compelled to collect for himself whatever he may require.

After an uncertain time, the violence of the fit abates; and probably in a few minutes the convulsion will have quite disappeared. The patient then will, perhaps, slowly recover her consciousness; she appears as if she were awaking from sleep, is perfectly unaware that any thing dangerous or extraordinary has happened, and has no recollection whatever of the interval. She will most likely complain now of an agonizing pain in the head. This truce will quiet the attendants, and restore something like tranquillity in the lying-in-room. Short-lived, however, are their favourable expectations: another attack will presently dissipate their hopes, and again all are thrown into confusion.

At other times, and more frequently, although the more violent symp-

toms of the attack have subsided, the patient remains comatose, without feeling or motion, lying in the senseless state of apoplectic stupor; the breathing heavy, dull, and stertorous. At others, again, a certain degree of consciousness returns, a knowledge of persons and objects, but an inability to articulate or make the wishes known; and often, with a partial return of consciousness, there is a constant rolling about the bed, and a low and distressing moaning. During the continuance of the fits, uterine action is not suspended, although no signs of pain are manifested by the woman, if she remain comatose. Sometimes, with each return of uterine action, a fresh paroxysm occurs; so that we may count the frequency and duration of the pains by the number and length of the fits. Occasionally, under convulsions, dilatation and expulsion have gone on so rapidly, that the child has been propelled into the world before the attendants were aware that labour had begun; and many instances have come under my own eye of a child being expelled during a strong fit. Baudelocque states, that he has seen some cases in which he found the child between the woman's thighs, though "an instant before he could discover no disposition for delivery."* Thus convulsions neither suspend nor interfere with efficient uterine action.

The infant is generally, though by no means universally, born dead, when the woman has been the subject of convulsive seizures, especially if the attack has occurred early in the labour, and continued for any length of time. It is difficult to account for this circumstance: pressure on the child's body or the funis umbilicalis, alone, cannot explain it. I suspect it is owing to the necessary changes in the fœtal blood not being effected during its circulation through the placenta, or to some baneful influence propagated to it from its parent. Denman† justly remarks, that the death of the child is rather to be considered as a consequence than as a cause of the convulsions; and Spence gives a case in which the mother having died of convulsions before there was any disposition to labour, the Cæsarean section was performed immediately after: the child was extracted alive, was itself soon seized with convulsive paroxysms, and died in less than hour.‡

* Translation, parag. 1109. This must surely be an exaggeration; but I have known no few instances where the persons in attendance would not believe that the child was born, because they had no idea that labour was instituted.

† Chap. xvi. sect. 2.

‡ System of Mid., Appendix, case 47.

If the paroxysms do not come on till after the termination of the labour, the child is almost always living; and in proportion to the number of fits, the length of time the disease has lasted before delivery, and the general violence of the attack, will be the probability of the infant being born dead. M. Menard thinks the child's death is owing to its having suffered

Premonitory symptoms.—Convulsions often arise suddenly, as just described, without any premonitory symptoms: sometimes, however, and I think almost generally, there are signs which appear a few days previously to the convulsions showing themselves; and at other times there are some which immediately precede the fit itself. Thus a woman will perhaps seem perfectly well, bearing the commencing pains of labour with great fortitude, and in good spirits, when she begins to ramble in her mind, talks incoherently, and will perhaps suddenly declare that there is a bright light in the room; and a convulsive paroxysm immediately succeeds. In my father's 176th case, the attack was ushered in with the exclamation that the room was studded with diamonds. After such a declaration, then, we might expect an attack of this frightful disease; but little time would be granted us for acting in prevention, since the more violent symptoms would almost instantly follow.

But there are others which appear a few days or hours before the fit, leading us to suspect that convulsions are likely to occur; but yet not so strongly marked as to warrant us in saying that the patient must necessarily experience an attack. These are such as we are in the habit of referring to an overloaded state of the brain;—intense headach; a feeling as if a blow was inflicted on the head; giddiness; a sensation of intoxication, and inability to walk straight; drowsiness; singing in the ears, and deafness; total or partial loss of sight; scintillæ, or *muscæ volitantes*, floating before the eyes in rapid succession; impeded utterance; numbness or cramps in the arms, and occasionally severe cramps in the stomach. Such symptoms, especially in full habits, should never be neglected: we may infer that they arise from a fulness of the vessels of the brain, and in most instances may deplete the patient both by bleeding and purging.

Prognosis.—Our prognosis must be most guarded in all cases of puerperal convulsions; for it is a highly dangerous affection; and the danger is in proportion to the length and strength of the fit; the shortness of the interval; but more especially to the degree of consciousness between the paroxysms. If the patient lies in a state of complete stupor, accompanied with stertorous breathing, when the paroxysm has subsided, and insensible to any ordinary stimulus that could be applied, even though the fits might be of short duration, I should consider her in greater danger than if the convulsions were stronger, with a state of perfect consciousness in the intervals of the attacks. Usually, the stronger the fits the deeper is

convulsions before delivery, and states that the contraction of its features and limbs on its birth proves this to be the case. (See Dict. of Pract. Med., Art. Convulsions.) I have not observed such an appearance of the infant in any case.

the accompanying coma; but that is not always the case; and I would rather form my prognosis by the intervening state than by the actual violence of the fits themselves. We may comfort ourselves with the assurance, however, that,—although convulsions are so dangerous, and although our prognosis must be in the highest degree guarded,—under our present improved treatment, the danger is scarcely in proportion to the frightfulness of the patient's appearance and the excessive alarm occasioned. The terror created in the minds of the friends is often so great that they at once give up the case as hopeless; and conceive the patient must be dying. In this respect, convulsions and hæmorrhages are strongly contrasted with each other; in the latter case, it not unfrequently happens that the fatal event is stealing on so insensibly, that the anxious friends, who are watching by the bed-side, are not aware of the impending danger until there is but little chance of recovery left. If we could be certain, indeed, that no permanent injury had been inflicted on any part of the nervous system, I think we might with much confidence hope for a favourable issue of most cases of puerperal convulsions.*

Treatment.—Our first duty, on the accession of a fit, should be to protect the patient from injuring herself by the violence of her struggles; and then to endeavour to prevent a recurrence of the paroxysms. With the first intention, one or two strong assistants should restrain her, so as to preclude the possibility of her throwing herself off the bed, and striking her head or arms against any hard body. Advantage must be taken of the depression of the lower jaw, which occurs at the commencement of each convulsive paroxysm, to insert some hard substance between the molar teeth, with a view to protect the tongue. A piece of fire-wood,—which can generally be procured on the instant,—will answer the purpose perfectly well: it should be wrapped round with a handkerchief or small fold of linen, and kept steadily in its place by an assistant, till the end of the fit: if allowed to slip out for a moment, the jaws may be violently closed, and extensive injury sustained. I have many times known the tongue so swollen by inflammation, consequent on laceration, that the teeth could not be brought together for some days.

Means must next be taken to relieve the patient effectually. Believing that the cause most commonly consists in pressure to which the cerebral mass is subjected, the same treatment must be adopted that we would have recourse to under ordinary apoplexy, viz., the abstraction of blood, and acting briskly on the intestinal canal. Bleeding is our great reliance

* From what I have seen of this disease, I should say that convulsions coming on after delivery, if the patient has not suffered an attack before, are not so dangerous as those which arise during pregnancy and labour.

—the lancet is our sheet-anchor—and blood may be taken to a very large extent; it may be necessary to draw forty, fifty, or sixty ounces, nay, even more, in the course of a very few hours. If ten or twelve only be abstracted, the patient seldom obtains much benefit; depletion will avail us little, unless a decided impression be made on the system generally. We observe that a woman will bear the loss of a larger quantity of blood under puerperal convulsions,—as in apoplexy—without fainting, than in almost any other affection. Venesection, however, had better not be attempted during the paroxysm; for the struggles of the patient will most likely prevent its being properly and beneficially performed. We may content ourselves with guarding her as perfectly as we can until the fit subsides; and when it has passed over, and she lies in a state of coma, or sensibility is somewhat returning, the operation will be easy.

Her head and shoulders should be raised as high as conveniently may be, a free opening made in one or both arms, and the blood allowed to run in a full stream. At first it will probably flow sluggishly, and dark in colour; afterwards it will come more freely, and of a more natural appearance; and it should not be restrained until a sensible effect be made upon the pulse; or commencing pallor of the lips indicate approaching faintness. The probability is, that from twenty to thirty ounces will be abstracted before this effect is produced. The quantity, within a certain moderation, should not be regarded; graduated vessels in such a case, to measure the loss by, are not required, any thing nearest at hand will serve our purpose equally well.

Our next indication is to procure copious evacuations from the bowels as early as possible. If the woman be sensible there will be no difficulty in administering medicine for this object by the mouth; but if she remain still under coma, she may perhaps be unable to swallow. An attempt may, nevertheless, be made to get some cathartic into the stomach; and with this view, ten or twelve grains of calomel may be mixed with a little sugar and put upon the tongue; and a table-spoonful of infusion of senna and jalap may be exhibited every half hour, till stools are produced. The probability is, that some part will pass down: for, in most instances, if we watch the proper opportunity, deglutition may be accomplished. In case, however, this cannot be effected, a strong purgative enema may be injected, and repeated if necessary; or a drop or two of croton oil diffused in a few grains of any suitable powder, may be thrown into the mouth, and a second dose administered, should the first not act within a reasonable interval; or both these means may be used in combination. Turpentine or assafœtida may be injected into the bowels, occasionally with great advantage.

By some, emetics have been recommended; but unless there were indi-

cations of the stomach containing undigested food in considerable quantity, I think emetics not called for; and commonly purgatives will answer the purpose of relieving the alimentary canal better than emetics.* Though the symptoms may give way for a time, we are not to expect an immediate cessation of the fits; a fresh attack will most likely occur, moderated or not in intensity, according to circumstances: after the lapse of a short period, therefore, another bleeding may be required; nor should we hesitate to have recourse to the lancet a second or even a third time, if the arterial system regain its power.

As an auxiliary of no mean consideration, the hair may be taken off, and cold applied to the scalp, and the shoulders should be kept in an elevated position. Gooch,† Blundell,‡ and Copland,§ speak of the advantage sometimes to be derived from drawing the woman's person partly over the edge of the bed, and pouring water unsparingly on the head.

I think it useless, while the violence of the convulsions lasts, to attempt the application of cupping-glasses to the back of the neck or behind the ears, or even leeches to the temples; or to blister the shaved head, or nape of the neck. The contortions of the patient's body would prevent the glasses being fixed, and there would be a great chance of their being broken, even if properly adjusted. It would perhaps be less difficult to apply leeches, but they are too slow in acting for our present purpose, and the urgency of the case demands more prompt and effectual means. The same disadvantages attach to blisters, even in an increased degree. Not that I object to local depletion; it is certainly desirable to unload the vessels of the brain by any method in our possession; but general bleeding is far preferable to the less powerful resources. Provided, then, the symptoms are but little alleviated,—while delivery is impossible, or would be attended with much hazard,—we may open the temporal artery, or the jugular vein; and thus secure the advantages both of general and local depletion at the same time.‖

But we may be fearful of taking any more blood either from the arm or nearer to the seat of distress, while yet the convulsive fits continue unabated in their severity: under such a case we have only one other resource—delivery, if it can be effected. Emptying the uterus will usually put a stop to the fits, at any rate for a time; and if there be no permanent

* Were I summoned to a patient soon after she had made a hearty meal, and especially if she had eaten freely of shell-fish or other not easily digestible food, I should exhibit a brisk emetic before resorting to purgatives.

† Compend., p. 247.

‡ Obstetricy, by Castle, p. 648.

§ Dict. of Pract. Med., Art. Convulsions, p. 434.

‖ "When from circumstances it is difficult to procure a sufficient supply from the arm, the temporal artery may be opened, or cupping-glasses applied behind the ears or on the temples."—(Locock, Cyclop. of Pract. Med., Art. Puerperal convulsions.)

injury done to the brain, it will generally mitigate them most materially. According to the progress the labour has made, must be the means we employ for this object. Thus, if the fœtal head be low down in the pelvis so that we can feel an ear, we may have recourse to the short forceps; if it be not within their scope, the long forceps may be employed; and if it remain entirely above the brim, we may be driven to the use of the perforator. Again; should the membranes be unbroken, we may turn the child and deliver by the feet. Of all these methods, we should much prefer delivery by the forceps, if it could be effected without injury; but, unfortunately, the operation is rendered very difficult, and in no small degree hazardous, by the rapid contortions accompanying each fit, and the incessant movements of the person in the interval of the paroxysms; which condition is mostly present when delivery is required. Although, then, the alternative offered by craniotomy is painful to contemplate, we should resort to it rather than run the risk of inflicting extensive injury on the mother's person. The child indeed, as I have before stated, is very frequently born still, after the mother has suffered from convulsions; but the chance of its previous death would not warrant us in taking the perforator in hand, if delivery could be accomplished safely in any other manner.

Neither is the operation of turning under convulsions free from objections. It would be most unwise to attempt its performance if the head were engaged in the brim of the pelvis—if the membranes had been ruptured for any length of time, and the uterus were strongly contracted round the child's body; because of the difficulty we must encounter, and the danger we must necessarily incur. Nor would it be judicious to attempt the forcible dilatation of the os uteri by the hand, especially if it be rigid. Bearing in mind that the remote cause probably exists in the uterus, and that the fits may owe their origin to irritation propagated from that organ to the brain, we should be most cautious not to add another source of irritation by our manual efforts. Under such a state of things bleeding should be carried to its fullest extent, rather than delivery be attempted. If, indeed, the mouth of the womb be open and flaccid, offering little or no resistance to the passage of the hand, particularly if the woman have had children before, and if the membranes be still entire at a time when it is thought requisite to evacuate the uterus,—turning might be undertaken with every prospect of a happy termination.

Even emptying the uterus, however, does not always put a stop to the fits; though they generally become less violent when the labour is perfected. If they continue equally as strong after the birth as before, whether the delivery has been natural or artificial, I should then suspect that some lesion had taken place within the brain, and should look upon the case as dangerous in the extreme. Still a continuance of the same means may be used, in a modified degree; leeches, cupping, (if it can be accom-

plished,) and blisters, may now be had recourse to, and mustard cataplasms to the feet or calves of the legs, in conjunction with cold applications to the head, and a continuance of purgative medicines by the mouth, and turpentine or asafœtida in enema. The same plan, aided by perfect quietude, a darkened apartment, elevated position of the upper part of the trunk, and the sparest diet consistent with the due performance of the various functions of the body, will also be found efficacious in removing the distressing headach which often remains for some days after a convulsive seizure; but which gradually disappears under such treatment. When recovery takes place it is mostly perfect, gradually brought about, and no trace remains of the serious attack the patient has suffered.

Merriman,* indeed, mentions having "known two or three instances of mania occurring as soon as the convulsions ceased, and remaining for some weeks, yet the patients ultimately got well;" and another of true chronic epilepsy, which continued for some years, until the woman died of pulmonary disease. Chronic epilepsy has not happened as a sequela of puerperal convulsions under my own observation; nor have I ever seen paralysis of any of the limbs follow;† but I have known one instance in which the fits appeared in three successive pregnancies, and two where temporary mania supervened. Dewees‡ mentions a case where the third and fifth labours were attended with convulsions, as well as the first; and he attributes the return to neglect of proper management during the last weeks of pregnancy. Both Perfect§ and Portal,‖ also, as well as Baudelocque¶ and Capuron,** have put instances on record, of convulsions attacking the same patient in subsequent labours.

The contrast between the fatality of the cases now met with, and those put on record by Saviard, Portal, and others in the seventeenth century, and Smellie, Perfect, and Spence, in the last, cannot but be a subject of high gratulation to the practitioners of the present day. Hunter, Lowder, and other teachers, were accustomed to state in their lectures,†† that more than one-half the patients attacked with this disease died. Jacobs‡‡ tells us that the case is almost always fatal, scarcely any of the patients having recovered; and in Nisbet's "Clinical Guide"§§ we read, that when

* Synopsis, p. 140.

† Lamotte (Traité des Accouch., edit. 1745, Obs. 363) notes one case of convulsions in which paralysis occurring before delivery continued more or less for six months; but he appends to the case the remark, that "this very attack of paralysis proves the disease to have been, not puerperal convulsions, but apoplexy; because paralysis is not a sequela of puerperal convulsions."

‡ System of Mid., 502.

‖ Pract. Obs., xvii.

** L'Art des Accouch., p. 397.

†† Ecole Pratique des Accouch., 1785, p. 238.

§ Cases in Mid., case 158.

¶ Parag. 1100, trans.

†† Merriman, Synops., p. 132.

§§ 1800, p. 357.

coma accompanies the fits, the disease "generally, though not always, proves fatal."

Few, comparatively, under good care, now terminate unfortunately; and the favourable results are to be attributed to the extent to which bleeding and other evacuant means are carried. Gooch* used to say that he never had lost a patient under convulsions, when free bleeding had been practised; but that all the women who had died under his observation had been bled insufficiently. Eight, ten, or twelve ounces of blood used to be considered as much as it was safe to abstract; and the principal reliance was placed on antispasmodic and *nervous* remedies, as they were called, consisting principally of æther, ammonia, camphor, musk, castor, and opium. Such medicines, as being stimuli, must add to the danger, by increasing the power of the circulating organs, and throwing more blood on the already overloaded brain.

There has been much disagreement among medical men as to the value of opium in puerperal convulsions. Manning,† Bland,‡ and particularly Collins,§ (who combines it with calomel or antimony,) strongly recommend it; while Hamilton,‖ Merriman,¶ Burns,** Dewees,†† my father,‡‡ with, I think, most other practitioners of the present day, consider it injurious. My own observation would lead me strongly to condemn it while the symptoms are urgent; and to be most cautious in its administration—if I used it at all—even after delivery, or when the violence of the attack had abated. Hamilton§§ advocates the exhibition of camphor in large doses; but, for myself, I have seen not the least advantage from this drug during the continuance of the convulsive paroxysms.

The English physicians have only recently in comparison carried the depleting practice to the extent now almost universally adopted; but some of the earlier French authors were strong advocates for the advantage of large bleedings, and Puzos‖‖ particularly insists on their necessity. Highly valuable, however, as the lancet is under such a state, it may still be abused: rashness must be deprecated here as well as in other diseases; and no more blood should be taken than is sufficient to produce the effect desired, whatever that quantity may be.¶¶

* Op. Cit., p. 244.

† On Female Diseases, 1771, p. 388.

‡ On Human and Comparative Parturition, 1794, p. 139.

§ Practical Treatise on Mid., p. 227, note.

‖ Pract. Obs., p 372.

¶ Synopsis, p. 135.

** Principles of Mid., 5th edit., p. 469.

†† System of Mid., 1825, p. 510.

‡‡ Pract. Obs., vol. ii. p. 271.

§§ Pract. Obs. page 371.

‖‖ Traité des Accouch., chap. xvi. art. 2.

¶¶ The accidental loosening of the bandage tied round the arm after venesection, seems to

We should be prepared to expect that a patient, after having suffered a convulsive seizure, would have no remembrance of any thing that occurred between the commencement of the attack and the time that she regained her sensibility; and we not only find this to be the case, but the disease seems frequently to wipe away all recollection of events that had happened some time before the accession of the fits, while she was perfectly conscious. Thus I have known many instances of a woman, apparently well when delivered, who (having become the subject of convulsions a few hours after) had no recollection of her labour, and was only convinced that she was delivered by her child being brought to her. My father* mentions a case in which, "although the lady at the time of her delivery appeared in perfect health, she had no recollection whatever, after her recovery, of the occurrences during her labour, or indeed of those of *some days* preceding that event: they appeared a blank in her existence." Blindness and deafness, continuing for some days, are no uncommon consequences of convulsions. Denman† mentions that in almost every case which he had seen, there was evidently, after delivery, a greater or less degree of abdominal inflammation; Collins‡ has found a strong tendency

have given the first idea of the value of larger bleedings than it was formerly the practice to resort to. This case occurred to Dr. Bromfield; and is mentioned by Denman, chap. xvi. sect. 5.

* Practical Obs., part ii. case 183.

The last patient I attended under convulsions, on Tuesday, December 8th, 1840, when she was restored to consciousness, had lost all recollection of every thing that had happened since the previous Wednesday. Her sister came from the country to spend a few days with her on the Saturday before. She was then apparently in her usual health and spirits; she welcomed her with pleasure, and yet she has now not the least remembrance of her arrival. On the Monday before her attack she had visited another sister, a patient in St. Thomas's Hospital; in the evening had walked from the neighbourhood of Bishopsgate Church to Temple Bar with her husband and sister; and after her return called on a medical man, whom she had never seen before, to engage his attendance in her expected confinement. She remembers nothing of the visit to the hospital, nor the subsequent walk, nor of seeing this gentleman; which latter circumstance, as he was a stranger, might be supposed to have made an impression. She is equally unconscious of all that passed during the six days. She recovered her sensibility on Tuesday evening; having been in a state of convulsions alternating with coma for about sixteen hours. She went into labour on the following Sunday morning, and was delivered naturally. It was her first pregnancy, and she was about seven months advanced; the child was born dead. She has recovered perfectly.

In vol. iii. of the Royale Académie de Médecine, there is a case given by M. Kœmpfen, of a cavalry officer who fell from his horse and pitched on the right parietal bone. He had vomiting and syncope; and a total want of recollection came over him of every thing that occurred the day previous to the accident, and for some hours after it. In a few days he was sufficiently recovered to resume his duty, but never regained his recollection of what had happened during these periods. Such an effect has been noticed in other instances of injury on the head.

† Chap. xvi. sect. 2, note.

‡ Page 211. He recommends minute doses of tartar emetic, after delivery, as a preventive.

to peritonitis, even where blood had been taken freely; and Gooch* gives a case exemplifying the truth of these observations. Although it has occurred to myself to meet with a few instances of peritoneal affection subsequent to convulsions, the number has by no means been so great as to have impressed my mind with the idea of the latter disease having any connexion with the former, had not such a remark been made by high practical authorities.

Hysterical Convulsions.—Nervous and irritable women are liable occasionally during labour, but more particularly under pregnancy, to convulsive fits of a much less dangerous kind than that which I have just described, which seem not to originate in pressure sustained by the brain, and for the subdual of which such active remedies are not required. In these the spasmodic affection is confined to the muscles of the trunk and extremeties, seldom affecting the face: there is not the same strongly marked disturbance of the sensorium, nor the same turgescence of the vessels of the head, nor the same hideousness of aspect.

There is a sensation of globus, palpitation of the heart, and a discharge of flatus on the termination of the fit. The muscles of the back seem to be the principal seat of spasm, so that the trunk is bent backwards, in the form of an arch;—a state of things mentioned both by Dewees† and Burns,‡ as strongly characteristic of the hysterical kind. Such cases frequently depend on irritation existing in the intestinal canal, and may generally be relieved by brisk purging, the dashing of cold water on the face, and warm frictions, or stimulating applications, to the stomach, abdomen, and back.

Many of the antispasmodic medicines will be found of service in this variety, and an assafœtida injection has sometimes at once cut short the disease.

APOPLEXY UNDER LABOUR,

and during the last few weeks of pregnancy, unattended with convulsive action, is sometimes, though very rarely, met with.§ The symptoms are those characteristic of the same disease under ordinary states of the sys-

* Op. Cit., p. 247.

† Parag. 1239. ‡ Page 461.

§ A case of this kind will be found in the Liverpool Medical Journal for June, 1834, by Dr. O. Roberts; and another in Cheyne's work on Apoplexy, page 88, by Dr. Kellie of Leith. I have only seen one case of apoplexy unattended with convulsions in pregnancy; this was fatal; it was in the sixth month, and was a twin gestation. No case of this kind, either during or after labour, has come under my observation.

tem; it is usually followed by paralysis, nor does the case require any other than the common treatment.

Both during the continuance of the convulsive paroxysms, as well as after their cessation, while the patient still remains in a state of imperfect consciousness, it is absolutely necessary that the bladder should be carefully attended to; as it may become inordinately distended, and perhaps serious mischief may ensue.

3d. LABOURS COMPLICATED WITH RUPTURE OF THE UTERUS.

Occasionally the uterus bursts, its structure gives way, and a rent is formed in its substance;—an accident of the most formidable nature, and which, by far most generally, terminates fatally. Rupture of the uterus is certainly a very rare occurrence, but there can be no doubt, both that it has often been the undetected cause of death, and also that, when known to the attendant, it has not unfrequently been concealed from mistaken feelings of policy.* The rent may take place at any part of the uterine structure—the fundus, the body, the cervix, or the mouth, may give way. It varies also considerably in its direction, being sometimes longitudinal, sometimes transverse, and at others oblique. The vagina may be implicated, or remain uninjured. The laceration may pass through the whole texture of the organ, and involve both membranes, an extensive communication being made at once with the abdominal cavity; or the peritoneum may be lacerated, and the parenchyma only slightly torn;†—or again, a large rent may extend through the inner membrane and the parenchymatous structure, while the peritoneum continues entire, the blood which is effused being pent up below it, and not extravasated into the general cavity of the belly.‡ It is most usual for the laceration to take place

* Burns (p. 477) states that its frequency has been calculated at one in 940 cases. Out of 48,719 cases, however, delivered by the midwives of the Royal Maternity Charity within the last twenty-one years, partly under my father's superintendence, but principally under my own, (when an occurrence of the kind could not have happened without our knowledge,) we have only had eleven instances of rupture of the uterus or vagina, being one in 4,429 labours.

† This is the rarest variety of uterine laceration; but instances of it may be found recorded by Sir C. Clarke, Transactions of a Soc. for Improvement of Med. and Chirurg. Knowledge, vol. iii. p. 290; by Prof. Davis, Obst. Med., p. 1067; my father, Pract. Obs., case 86, part i. p. 409; Mr. Chatto, Med. Gazette, 1832, p. 630; Mr. White, Dublin Journal of Med. and Chem. Science, July, 1834, p. 325; and Mr. Partridge, Med. Chirurg. Transactions, vol. xix. p. 72. These, I believe, are all that are on record.

‡ See my father's Pract. Obs., case 81; Velpeau, edit. de Brux., p. 332; Hamilton, Pract. Obs., p. 376; Davis, p. 1068; and Steidell's first case, Med. Comment., vol. vi. p. 123.

through all the structures at once. The rupture may be instantaneous, or more gradual; a large rent, sufficient to allow the child to escape into the abdomen, may happen in an instant; or a small aperture may first be made, and gradually increased with each return of uterine contraction, until it has acquired a size sufficient to permit the passage of the whole fœtal body out of the uterine into the peritoneal cavity.

Causes.—Rupture of the uterus during labour* may be produced by the violence of the uterine efforts themselves—the viscus bursting under its own inordinate action;†—or it may be the consequence of forcible and improperly conducted attempts to turn, under a shoulder or other presentation; of which sad catastrophe I have unfortunately seen more than one instance;—or, again, it may be caused by instruments, in the hands of the ignorant, the careless, or the inconsiderately rash. It is impossible to believe with La Motte,‡ Levret,§ and Crantz,‖ that the struggles or convulsive movements of the child can ever occasion it.

This accident may occur to women bearing a first or subsequent children; to the young, as well as those more advanced in life—to the plethoric and the debilitated—to the healthy and the ailing. But out of the many cases to which I have been called, I have only known two instances in which it happened during a first labour¶. It may take place as well under a head, a breech, or a transverse presentation, and at any period of the labour. It has been known to happen at the very commencement of the process, when the os uteri had not acquired a dilatation equal to the diameter of a shilling.**

* The uterus may be burst under pregnancy, as any of the other abdominal viscera might be, by force applied from without, such as the being run over by a carriage, and the like accident; but such do not come within the scope of the present observations.

† Hamilton (Pract. Obs., p. 378) states that he saw one case in which the uterus ruptured itself under a convulsive fit; and he therefore regards convulsions as an exciting cause; but I do not know any other instance on record of a similar kind; and we cannot but look upon these two occurrences happening together in the same labour as purely accidental.

‡ Traité des Accouch., 1765, parag. 596.

§ L'Art des Accouch., 1761, p. 106.

‖ Commentarius de Rupto in partus doloribus fœtu Utero, 1756, parag. 8. A translation into French of this memoir will be found appended to Puzos, Traité des Accouchemens, 1759, 4to.

¶ Out of thirty-four cases noted by Collins, seven occurred in first labours. He states that he was for a long time of opinion that women in labour of a *first* child were rarely liable to this accident; but that experience has convinced him this was an error.—(Pract. Treat. on Mid., p. 305.)

** A preparation of ruptured uterus was once sent to my father, in which the child and membranes had passed into the peritoneal cavity before the os uteri could admit two fingers.—(Pract. Obs., &c., case 84.) Most likely, in this instance, there was disease in the uterine structure—a softening or thinning of texture, for instance, consequent on inflamma-

Laceration of the uterus is most likely to happen to a patient who has had three or four children, who possesses a slightly distorted pelvis, and who has been in strong labour for a number of hours.

Although the rent may take place in any portion of the organ, its most frequent seat is at the neck, either at the posterior part, opposite the prominence of the sacrum, or anteriorly, behind the symphysis pubis.* The direction is also mostly transverse, or slightly oblique. It is not difficult to account for this being the most usual situation of the injury; for since, during the latter part of gestation, the neck of the womb rests upon the pelvic brim, if the promontory of the sacrum dip too far forward, or the ridge of the pubes be preternaturally sharp, it is reasonable to suppose that the uterine structure may be affected, that inflammation may occur as a consequence of pressure, and that a thinning or softening of the substance may be induced; and under these circumstances, should the structure give way at all, it is likely that the weakened part will be the first to suffer.†

Denman, indeed, says that, "independently of disease, the uterus may be worn through mechanically, in long and severe labours, by pressure and attrition between the head of the child and the projecting bones of a distorted pelvis; especially if they be drawn into points, or a sharp edge."‡ One or other of these causes may explain why we more frequently meet with laceration of the uterus when the pelvis is *slightly* contracted, in the conjugate diameter at the brim, than when the *distortion is excessive.* It must not be forgotten, however, that by a fall, or other accident, the uterus may be so much injured as to induce a degree of disease that will

tion; for we cannot suppose that the healthy womb would, by its own powers, lacerate its substance before the membranes of the ovum had given way; and while its mouth was undilated.

* It is very rarely that the fundus gives way, unless as a consequence of violence inflicted on the body externally; or perhaps from the hand of the attendant in endeavours to turn the child.

† In the last case but one of ruptured uterus to which I was called, (Oct. 23, 1840,) dissection showed that the linea-ileo-pectinea, where it traverses the pubes, was formed into a very sharp ridge, that there were a number of bony prominences jutting from the inner surface of the pubic bones towards the cavity, and one especially, situated above the left thyroid foramen, which was so pointed as to pain the finger when hard pressure was made on it. The sacro-pubic diameter was two inches and three quarters in extent. It was the woman's second pregnancy; the first child had been delivered by craniotomy. After a consultation held, labour on this occasion was induced in the eighth month by the exhibition of four doses of the ergot. The membranes broke spontaneously, three hours and a half before the accident occurred. I was sent for by the gentleman in attendance immediately, and delivered by turning; she died on the night of the fourth day. See Burns, p. 471, for a somewhat similar case.

‡ Chap. x. sect. 7, parag. 8.

predispose it to lacerate at that spot where the blow was inflicted, when it takes on itself expulsive action.*

Symptoms.—The symptoms of ruptured uterus are strongly characteristic of some violent injury having been sustained; and they may be divided into the local and more general marks. The history of the case will be somewhat of this kind.

A woman who has probably had children before—who has generally suffered lingering labours—who we know possesses a small pelvis—and for whose safety we are consequently more than usually solicitous—is to all appearance going on well in labour, having borne, with fortitude and good spirits, a number of strong expulsive pains; when, in the acmé of one of these powerful contractions, she suddenly shrieks, cries out that something has given way within her, and expresses herself as being in violent agony.† From that time, all proper uterine action ceases, or becomes very much diminished.

If an extensive rent be formed at once, the probability is that the labour pains will be instantly suspended; but if it be only slight in the first instance, they will most likely be continued for some little time, though their character will be more feeble, and with each return of contraction there will be an increase in the laceration. Should the pains of parturition entirely cease, their place will be supplied by a new pain, referred to one fixed spot, constant, most agonizing, and much more difficult to bear than the throes of labour.

There is seldom observed, consequent upon the accident, a copious hæmorrhage. It might be supposed *à priori*, as the vessels of the uterus are so large, that when they are torn, blood would be poured out rapidly from their lacerated cavities, in a somewhat similar way as when the placenta is partially separated before or after the child's birth. But this is not the case; there is seldom considerable flooding as a consequence of ruptured uterus, and sometimes there is but little or no increase of discharge whatever.‡ Even should the vessels bleed freely, their contents need not escape externally; for the head of the child may be so block-

* Perfect relates an instance (case 78) in which a fall, six weeks previously, seemed to be the predisposing cause of rupture during labour.

† It is said that this rending sensation has been accompanied by a noise distinctly audible to the attendants in the room; but as I was never present when the accident happened, I have no opportunity of verifying or refuting the assertion by my own observation. (See Observations on Ruptured Uterus, by Dr. Andrew Douglas, London, 1785, p. 49; also Dewees, parag. 1382; and Perfect's Cases in Mid., vol. ii. p. 60.)

‡ Hamilton (Pract. Obs., p. 377) says, according to his observation, that when the rent is transverse, an immense effusion of blood into the cavity of the abdomen follows; but that longitudinal lacerations are not productive of the same effect.

ing up the pelvis as to prevent the exit of the fluid through the vagina; and it may be effused into the cavity of the abdomen.

On making an examination soon after this new pain is complained of, we shall usually find that the head, which could be easily detected at our previous examinations, can now only just be touched, or it may have receded completely out of the reach of the finger, so as to elude our search. This is owing to the admission of the child's body more or less within the peritoneal cavity, through the rent thus accidentally made. We are not, however, to expect this as a universal symptom;—though, when it does occur, it may be considered one of the strongest diagnostic marks we can observe,—because it is not unlikely that the head may have previously become locked in the pelvis, having been forced into the cavity by the contractions of the uterine fibres; and if it be firmly jammed, it is impossible that it can free itself so as to recede.

Occasionally, then, it will happen that the whole of the child's body at once escapes through the rent into the abdominal cavity; nay, the same strong contraction that caused the rupture has expelled both child and placenta into the peritoneal sac; and the uterus continuing to act, they have both been enclosed in a shut cavity, to which there is no outlet.*

Cases are on record also where the same contraction that caused the laceration expelled the child into the world.†

Whenever the fœtus has thus escaped more or less out of the uterus into the cavity of the abdomen, its limbs may be traced through the abdominal parietes; the breech, legs, and perhaps the arms, may be felt tolerably distinctly.‡

The symptoms I have just enumerated are particular signs, and belong exclusively to the case we are considering; but there are others of a more general character, which soon take place, and are themselves also highly

* In a case that occurred within the knowledge of my father, the fœtus was expelled into the belly through the rent, and by the same uterine effort the placenta was thrown into the world through the vagina.—(Pract. Obs., part ii. case 217.) I was called to a case of ruptured uterus, in which, although the head originally presented, I found on my arrival the breech offering itself. The laceration took place at the cervix, implicating also the vagina, while the head was entirely above the brim; the upper part of the child had escaped through the new-made opening into the abdominal cavity, and the fundus continuing to contract, the breech was forced down into the situation the head had originally occupied; the child's body was thus made to perform an evolution, and the breech passed into the pelvis; from which I extracted it with some difficulty.

† See Burns, p. 470. In a case of recovery after this fearful accident, related by Mr. Currie of Liverpool, (London Med. Gazette, Feb. 27th, 1836,) the breech presented, and the laceration took place between the expulsion of that part and the birth of the shoulders.

‡ The being able to trace the fœtal limbs through the parietes of the abdomen, in conjunction with the recession of the head, almost or entirely out of the reach of the fingers, is to be regarded as an infallible proof of this dangerous occurrence having taken place.

characteristic of the accident. The general symptoms, indeed, are exactly such as we should expect to meet with in cases of extensive injury to any of the abdominal viscera. The pulse soon flags, it becomes very quick, irregular, and so feeble as to be scarcely perceptible; the respiration becomes hurried, laboured, and painful; the countenance anxious and dejected; the eyes sunken, dull, and inexpressive; the belly swells rapidly, and almost immediately becomes very tender to the touch. Vomiting of a dark-coloured matter supervenes, sometimes almost instantaneously, sometimes at a later period; there is generally hiccough; the extremities become cold and insensible; a cold sweat breaks out on the face, forehead, neck, and chest; and if delivery be not effected, the patient will almost always gradually sink in a very few hours from the accident.

Prognosis.—Although a laceration of the uterus is to be looked upon as the most dangerous accident that can happen to any of the pelvic viscera during labour, with the exception only of a rupture of the bladder, still it is not to be considered necessarily fatal; many cases of recovery are on record, detailed by Heister,* Peu,† Douglas,‡ and Kite;§ but, to name more recent authors, the late Dr. Hamilton‖ met with one, so did his father.¶ Madame La Chappelle,** Haden,†† Blundell,‡‡ Frizel,§§ Dunn,‖‖ Currie,¶¶ Birch,*** and Smith of Maidstone,††† besides some others, each give us one. Davis,‡‡‡ Collins,§§§ and M'Keever,‖‖‖ have noted two; and my father has seen three.¶¶¶ Thus, although the acci-

* Surgery, part ii. sect. 5, cap. xiii. sect. 14. He relates it as communicated to him by Rungius, (evidently a Latinized name,) who was a respectable surgeon at Bremen. The intestines were distinctly felt protruding through the rupture into the cavity of the uterus after the child was extracted. Rungius kept them back with his hand till the organ was sufficiently contracted to prevent them prolapsing again; and the woman happily recovered.

† Pratique des Accouch., 1694, p. 341. In this case the uterus was torn and pierced in several places by violent efforts to deliver; the neck of the bladder was also lacerated.

‡ Observations on Ruptured Uterus 1785; case of Mrs. Manning, p. 7.

§ Mem. Med. Soc., Lond., vol. iv. p. 253.

‖ Select Cases in Mid., p. 138.

¶ Outlines of Midwifery, 3rd edit., p. 348, note.

** Annuaire Med. Chirurg., tom. i. p. 542.

†† Trans. of Society of Improvement of Med. and Chirurg. Knowledge, vol. ii. p. 184.

‡‡ Obstetricy, p. 704, note.

§§ Trans. of King and Queen's Coll. Phys., Dublin, vol. ii. p. 15.

‖‖ Edinburgh Med. and Surg. Journal, vol. xl. p. 72.

¶¶ Med. Gazette, Feb. 27th, 1736, p. 854.

*** Med. Chirurg. Trans., vol. xiii. p. 357.

††† Ibid., p. 373.

‡‡‡ Obst. Med., p. 1070.

§§§ Pract. Treatise, p. 247.

‖‖‖ On laceration of the Womb and Vagina, 1824.

¶¶¶ Pract. Obs., part ii. case 207, and two following. All these three women became subsequently pregnant; one of them my father attended twice afterwards in labour; another died of flooding, undelivered, between the sixth and seventh month of gestation. On opening the

dent must be considered, as one of a very formidable character, yet we are not to give up the case as hopeless: we are both authorized, and bound to make some efforts to preserve the patient.

Treatment.—There is but one mode of practice, however, that offers the least chance of life—and this is speedy delivery. The instant I knew the accident had occurred, I should proceed to extract the child—provided delivery could be accomplished—as being the most likely way to save the mother, and the only means of preserving the infant.* If the head has entered the pelvis, and has not retreated, so that the long or short forceps can be used, the child may be extracted by their agency. But we generally find that it has receded beyond the reach of that instrument; and we must then introduce the hand into the uterus, follow the child's body through the rent made into the abdomen, if it have escaped; search for the feet, draw it by their means back through the same opening into the cavity of the uterus, and extract it *per vaginam*. If it should happen that after the breech and shoulders are born the head remains above the brim, and will not pass in consequence of the contraction of the pelvic bones, we shall be compelled to open it behind the ear, and extract it as I have before directed.† The preservation of the child indeed is not to be expected, and scarcely to be hoped for under these circumstances, for in

body there was detected at the anterior part of the uterus a cicatrix, running in an oblique direction, which evidenced the union that had taken place after the rupture. Frizell's patient had one child afterwards; Dunn's had two; so had Lambron's, (vide note p. 424, of this work;) and Douglas's, it would appear, had three or four. In the year 1839 I was called to a patient, who after a very lingering labour, had been delivered of her first child by craniotomy seven hours and a half. An attempt had been made unsuccessfully to remove the placenta. I found the woman much exhausted; the uterus was firm, the placenta wholly within it; on introducing my hand into the vagina, it passed through a rent in the back part, either of the vagina or cervix uteri, into the abdominal cavity. I felt the posterior peritoneal surface of the uterus distinctly, as well as the intestines. I withdrew it, again introduced it in a different direction, when it entered the uterine cavity. The placenta was strongly and universally adherent. I separated it, and took it away, with some difficulty. No blood flowed either during or after the operation; nor did any proper lochial appear, but in their place a most fœtid discharge came on and lasted till the twenty-first day; a portion of putrid, fibrous matter, nearly as large and as thick as a woman's hand, then came away, certainly no part of the placenta, and the discharge ceased; she was able to leave her bed at the end of the month; five weeks after her confinement she became the subject of melancholia, which at the end of a fortnight disappeared; and she subsequently recovered perfectly. Three other women I have delivered who I expected might recover, two having lived a week, and one six days.

* "I attribute the successful issue of this case, in a great measure, to the promptness with which the woman was delivered after the accident had occurred."—(Ramsbotham, Pract. Obs., part ii. p. 489.) The recovery of the patient "seems in a great measure to depend on the speedy removal of the child from among the viscera."—(Douglas on Ruptured Uterus, p. 67.) "The author is strongly impressed with the belief that nothing but immediate delivery can save the life of the woman."—(Hamilton, Pract. Obs., p. 383.)

† Page 298.

almost every instance of ruptured uterus on record, and in all which I have myself attended, the fœtus has been born dead.* Levret† insists upon the necessity of cutting through the parietes into the abdominal cavity immediately the event is detected; and Baudelocque‡ thinks, if delivery cannot be perfected by the forceps, that this mode of removing the child is much preferable to extracting it by the vagina. He limits delivery by the feet to those cases where they are found at the os uteri, or where the child remains entirely within the uterine cavity, or where the vagina only is ruptured, the uterus itself being uninjured. I think myself the British practice far superior to that inculcated by Levret and Baudelocque. During the passage of the child from the abdomen through the uterine rent, great care must be taken lest any folds of intestine be brought down with it, and involved in the opening; because, on the uterus contracting, they would necessarily be strangulated, add very much to the present suffering, and dissipate the slight chance of safety still remaining.§

Every circumstance connected with rupture of the uterus is agonizing to the utmost extent; the suddenness and awful nature of the accident, the rapid sinking of the vital powers, and the almost certain loss of the infant, all combine to render this a case of most aggravated distress. To these may be added the horrible feeling experienced in the delivery by the feet, at the hand being introduced into the centre of the abdomen of a living person. Nothing can be more appalling than the sensation communicated by the intestines encircling and coiling round the fingers; but, however horrifying the idea, all feelings of repugnance must give way before a sense of duty. It is seldom under laceration of the uterus that the perforator can either be necessary or available as a means of delivery before the body of the fœtus is extracted; for if the head be locked in the pelvis, which is not often the case, the labour may most probably be concluded by the forceps; and if it remain entirely above the brim, it will either have receded out of reach, or will be pushed up on the application of the instrument, and not afford sufficient resistance to enable us to perforate the cranial bones. This cause of disappointment I have myself in no few instances experienced; and have found turning, therefore, the operation most generally applicable to this emergency.

As soon as delivery has been effected, a large dose of opium or mor-

* Collins states (p. 247) that out of thirty-four children two were born alive, but this I should look upon as beyond the general average of live births.

† L'Art des Accouchemens, p, 105. ‡ Parag. 2177, trans.

§ In Rungius' and Currie's cases, as well as many others on record, the intestines protruded through the laceration into the uterine cavity; and Baudelocque (parag. 2166) informs us that they were actually strangulated in a case that occurred under the hands of M. Percy.

phia must be given, the utmost quietude must be observed, every thing stimulating—unless the depressed state of the system requires the administration of some cordial—must be avoided, and the restorative powers of nature must be trusted to for the recovery. I know no medicines but those of the soothing kind that are likely to be of service; and no other specific means can be adopted until inflammatory symptoms appear; when the case must be treated upon common principles.

But it is not always possible to deliver the patient by the natural passages. The mouth of the womb may be rigid, and not sufficiently dilated to admit of the hand being introduced; but this is rare; or what is more probable,—especially if the rent be in the fundus or near it,—the uterus may have expelled the child and placenta entirely into the abdomen, and contracted so strongly as to have closed its cavity. Under such a state it would be most injudicious to endeavour to extract the child in the ordinary way, both because of the additional hazard, which must attend on any attempt to gain an entrance into the uterine cavity; and because, even were the hand admitted, the rent through which the child had escaped would be so much diminished in extent, by the contraction of the parietes, as to preclude the possibility of bringing the fœtal body again through it without considerably increasing it, and adding to the original danger.

In these perplexing cases, it becomes a point of much nicety to determine whether the patient should be left to the resources which nature may supply, or whether any means should be taken for relieving the abdomen from the presence of the fœtal body.

There are many cases of reputed rupture of the uterus on record, in which the child has been left in the cavity of the abdomen, and has been evacuated in a putrid state by abcess, the woman perfectly recovering. I am far from denying the *possibility* of such a termination to the case; but I should look upon it as most *improbable;* and I cordially coincide with Dewees* in the opinion, that almost all these cases have been instances of extra-uterine conception, and not of impregnation of the womb, attended with rupture of the organ.†

Feeling as I do that to leave the child in the cavity of the belly is almost certain death to the mother, I should seriously entertain the ques-

* Parag. 1361.

† The cases of this kind least liable to suspicion, perhaps, are those related by Baudelocque, (parag. 2149,) when it was believed the uterus had been ruptured by a fall in the fourth month of pregnancy; after which the fœtus was evacuated by abscess, through the abdominal parietes; and those given by Davis, (p. 1072,) which occurred under the notice of Dr. Sims and Mr. Windsor.

tion whether the parietes of the abdomen should be divided, and the child extracted by that means, or whether the patient should be abandoned to the chance of what nature might effect; and the answer must depend entirely on the circumstances of the individual case. If she were in tolerably good spirits,—if she had not suffered so great a shock as usual from the accident,—particularly if, after explaining to her what had occurred, she were anxious for the operation to be performed, I should have no hesitation in undertaking it. But if I found her sinking,—if the powers of life were ebbing fast,—and particularly if thirty or forty minutes had elapsed since the rupture, and the movements of the fœtus had quite ceased,—I should by no means sanction the incision, because of the painful nature of the operation; and because I should presume it would avail nothing, and might probably hasten her death. Much, then, must be left to the judgment of the practitioner; and his determination must depend entirely on the state of the patient, and the probability of the child's being saved. For the sake of the infant, it would be right to urge the operation immediately after the accident with greater force than if half an hour or longer had elapsed, because, while there is a chance of the child's survival, its welfare must be considered as well as that of the mother; but after its death, the mother, of course, would alone interest us.*

Premonitory symptoms.—Generally laceration of the uterus takes place, without any symptoms indicating even the probability of its occurrence; but many premonitory signs have been noted by Crantz,† Levret,‡ Burns,§ Hamilton,‖ Davis,¶ and others, as forerunners of the accident; these are all most unsatisfactory, and unfortunately not to be depended on. It would be most desirable, indeed, if some infallible precursor of this dreadful occurrence were discovered, that delivery might be effected before the laceration happened, and thus the peril be averted.

We certainly may fear that laceration will ensue, if the woman possessing a small pelvis is in labour of a third, fourth, or fifth child; if her previous labours had been lingering, and more than ordinarily painful; if for six or eight hours she have been suffering strong expulsive throes, attended with little progress; if she complain of a violent crampy pain in one particular

* The operation of gastrotomy after rupture of the uterus for the extraction of the infant has very rarely been performed; but there are the histories of some successful cases on record; thus M. Thibaut Desbois of Mans published one in which the mother recovered.—(Journal de Med., vol. iii. p. 448, Mai, 1768.) M. Lambron operated in this manner twice on the same woman: (Baudelocque, trans., parag. 2180;) the last time saving both mother and child. She became pregnant again, and was delivered of a healthy child naturally. In vol. v. of Journal Complémentaire du Dict. des Sciences Med., p. 189, Dec. 1819, a case of this kind is given, operated on by MM. Bernard, Latouche, and Josset, in which the woman was preserved.

† De Rupto Utero, parag. xiv. ‡ L'Art des Accouch., parag. 598.

§ Mid., p. 492. ‖ Pract. Obs., p. 385. ¶ Obst. Med., p. 1069.

part of the uterus, increased under a contraction, but never entirely disappearing, particularly if that should be the spot opposite the promontory of the sacrum, or behind the symphysis pubis. With the presence of such symptoms, I should consider it probable that the uterus had received some injury, and I should fear that if the labour were allowed to go on unassisted, the organ might rupture. Under these circumstances, I should consider myself fully warranted in having recourse to delivery before the woman's powers began to flag, provided the child could be extracted by the forceps, without injury either to itself or its parent.

Though as much averse as any person can be to unnecessary instrumental interference, I have applied the long forceps with great success in some cases where such a state of things was present,—not because the patient was sinking, but because of this fixed and agonizing pain,—dreading the possibility of rupture of the uterus;*

I have seldom known a case in which the uterus ruptured where the attendant was not more or less blamed; and that, as may be gathered from what I have advanced, most unjustly.

4th. LABOURS COMPLICATED WITH LACERATION OF THE VAGINA.

Laceration of the vagina is often complicated with rupture of the uterus; but, occasionally, the whole of its coats burst while the uterus remains entire, and the child escapes more or less into the abdominal cavity.†

Such cases are usually attended by symptoms similar to those that accompany rupture of the uterus; they are almost equally dangerous, and are to be treated exactly on the same principles.

But a laceration of some of the fibres of the mucous membrane and muscular coat at the back part of the vagina sometimes takes place,

* Levret, Hamilton, Davis, and others, recommended liberal bleeding when such symptoms arise as they suppose threaten a laceration of the womb; Hamilton and Davis, after venesection administer full doses of opium. Both these means will be useful to quiet inordinate uterine action; but I should prefer delivery without loss of time, if it could be accomplished without injury.

† Laceration of the vagina, to the extent of allowing any part of the child to pass into the peritoneal cavity, is, as far as I have been able to judge, a much rarer accident than rupture of the uterus. But Merriman (Synops., p. 35, note) mentions having seen two cases, each of which was occasioned by the midwife forcibly dragging the child swollen with putrid air into the world; one will be found in the Med. Chirurg. Review, July 1834, p. 224, transcribed from Siebold's Journal; M'Keever (Med. Chirurg. Review, Dec. 1821, p. 530) met with one; Ross (Annals of Med. vol. iii. p. 277) reports one, after which recovery took place; the woman be.

while the head is occupying the pelvis. This is most usual in first labours, when rigidity exists, and the parts do not dilate with their usual degree of ease.

The medical attendant may perhaps be sensible that a laceration has occurred; but it may take place when neither the medical man nor the patient are at all aware of what has happened, the pain which the parts are suffering being but little increased by the fibres giving way. After the birth, inflammation will supervene, the healing process will be established, and in the next labour a small cicatrix may perhaps be felt, which may give the first indication of the previous occurrence.

Treatment.—If the laceration were to a great extent,—if we feared it might run into the rectum, or up to the os uteri, we should hasten the delivery of the child by the forceps, provided they could be used with advantage; but if it were trifling, the labour must be allowed to proceed in the natural way, the laceration being carefully watched, and the perineum most assiduously supported, when the head comes to rest upon it. After labour is completed, a poultice may be applied: and if there be no contra-indicating symptoms, a full dose of opium may be given; and the bowels should be early relieved.

5th. LABOURS COMPLICATED WITH RUPTURE OF THE BLADDER.

A more fatal accident even than rupture of the uterus, is the bursting of the bladder during labour, and the evacuation of its contents into the peritoneal sac.* It appears to me that this accident must always be the effect of neglect or improper interference; it very seldom, indeed, or never, can occur in the hands of a careful and judicious surgeon. The kidneys under lingering labour rarely secrete the same quantity of urine in the same space of time as they are accustomed to do in the ordinary states of the system, because much of the fluids is carried off by perspiration; and the secretions of the skin and urinary organs are in a great degree vicarious;

came again pregnant, and the same accident occurred at the same part of the vagina—she recovered a second time also; and my father gives a case (part i. case 87) in which, after death, an extensive laceration of the posterior part of the vagina was discovered communicating with the cavity of the belly, but not implicating the uterus. I was called to a case once, in which the *anterior* part of the vagina had given way below the os uteri, and the child had escaped between the uterus and bladder into the cavity of the belly; both the latter organs remaining uninjured. I should scarcely have supposed one or other of these organs could have escaped a participation in the accident, if dissection had not positively convinced me of the fact.

* This accident is fortunately very rare; but two cases to which my father was called will be found detailed in part i. of his Pract. Obs., cases 89 and 90.

but, at the same time, the action of these organs is by no means suspended; a certain quantity of urine is constantly distilling through the ureters, and the bladder becomes at length distended. If this distention is allowed to proceed beyond a certain point, it will burst, and the case becomes perfectly hopeless.

The rash or careless employment of instruments under a distended state may also cause laceration. If the forceps are applied while the bladder is full, the action of the instrument is very likely to occasion it to give way; and for this reason I have before particularly inculcated the necessity of thoroughly evacuating this viscus before any attempts at delivery are made.

Symptoms.—When laceration of the bladder has taken place, the symptoms are exceedingly distressing and strongly marked; they are very much like those characterizing a rupture of the uterus; the recession of the child, however, the being able to trace its limbs through the abdominal parietes, and any increase of discharge through the vagina, being wanting;—they are, the appearance of a sudden and violent pain in the region of the bladder, accompanied with a shriek, and a declaration by the patient that something has burst within her; a rapid sinking of the powers of life; a general tumefaction, and great tenderness of the abdomen. The labour-pains—which usually cease on a rupture of the uterus—continue for an uncertain time, till they decline as a consequence of exhausted powers. The particular symptoms present in this case, and absent in rupture of the uterus, are, a loss of the vesical tumour which before could be felt distending the abdominal parietes, and in its stead a more diffused swelling of the belly, combined with some degree of fluctuation.

Since rupture of the bladder is so universally fatal, and since it can usually be prevented if proper attention be paid, it becomes our duty, under lingering labour particularly, to keep a watchful eye over its condition; and if it become immoderately full, to relieve it by the catheter. It is possible, however, that the urethra may be a little turned to one or other side, out of its regular straight course, by the pressure of the head, and difficulty may be experienced in introducing a silver instrument; if such an impediment should exist, it must not be overcome by force, but a flexible male catheter must be used instead.

It has never occurred to me to meet with a case in which it was necessary to puncture the bladder during labour, owing to an inability to introduce the catheter; but such may doubtless possibly occur; and if so, the puncture should be made immediately above the symphysis pubis, in the hope that the peritoneum, drawn up by the rising of the bladder from the pelvis, may escape injury.

Treatment.—Regarding this accident as unavoidably fatal, and con-

sidering that the woman will most certainly die, I think that our principal care should be directed to the preservation of the child, and to endeavour to extract it before its death, by the forceps, or by turning.

If there were indications of its being still living, I should consider the use of the perforator in most cases unjustifiable, and it would become a question whether, if no means of delivery *per vias naturales* could be resorted to, compatible with its safety, the Cæsarean section should not be performed.

Such a mode of delivery, however, should never be contemplated while the woman's powers remain at all vigorous, or the uterine contractions continue active; for so long there is a chance both of the child's life being preserved in utero, and also of the labour being naturally terminated.

The death of the child, when it does occur, is dependent on the exhausted state of the mother's system, and not upon any destroying influence existing within its own person.

The child, then, having been extracted, although our solicitude for the mother's preservation be wrought up to the highest pitch, I fear any farther efforts to save her will be fruitless and disappointing. I cannot coincide with a great authority in this city, who has suggested the possibility of opening the abdominal cavity, sponging out the extravasated urine, cleansing the peritoneum by ablutions of warm water, drawing up the bladder, placing a ligature around the lacerated opening, and hoping for a successful issue.* I would prefer abandoning the woman to her fate, certain and fearful as it is, to attempting such a means of prolonging her existence, upon the principle that I would rather sit quietly at her side, and watch her gradually sink by the hand of nature, than myself be the instrument of hastening her end.

6th. LABOURS COMPLICATED WITH SYNCOPE NOT PRODUCED BY HÆMORRHAGE OR LACERATION OF THE GENITAL ORGANS.

Both during and after labour, women become occasionally the subjects of syncope, unconnected either with hæmorrhage or laceration of any of the organs more immediately concerned in parturition. In women of a delicate habit, nervous and hysterical, slight faintings under the first stage of labour are by no means uncommon; and in the higher ranks of life, therefore such complications are most frequently observed. They are also not unusually met with in the abodes of poverty, where a want of

* See Blundell's Obstet. by Castle, p. 479.

proper ventilation and sufficient nourishment combines, perhaps, with an habitual use of ardent spirits, to destroy the vigour of the system, and incapacitate it from bearing up against the exertion attendant upon labour. Such cases require but little consideration; the vital powers must be sustained at a certain point by the stimulus either of warmth, fresh air, easily digestible nutriment, or by the judicious use of wine, spirits, æther, or ammonia.

If organic disease exist in any of the viscera, particularly those of the thorax, sudden death may take place, consequent on the violent struggles attendant on the expulsive pains; an aneurism, or an abscess, may burst; or the heart may be choked, or its action otherwise impeded.*

But a more simple cause of syncope after the child's birth, independently of hæmorrhage, consists in the collapse consequent on the rapid abstraction of that pressure from the abdominal viscera and large vessels of the trunk, to which they had been so long accustomed. When treating of artificial delivery under placental presentations, I referred to this sudden change in the relative situation of the contents of that cavity, as adding, in no small degree, to the danger of the case; and I have known faintness

* I was once requested to be present at the inspection of the body of a woman, about forty years old, who had died suddenly in labour of her first child. She had been for seven years subject to great difficulty of breathing, with cough, which had latterly increased, and the sputum had been occasionally streaked with blood. Some hours after the membranes had ruptured, while standing by the bed-side, during a uterine contraction, she seized hold of her attendant's arm, and, without uttering an expression, she fell on the floor dead. On opening the body, we found in the two cavities of the pleuræ nearly three pints of serum; the lungs, independently of their compressed state, were healthy; the pericardium also contained a considerable quantity of fluid.

On another occasion I was requested by an old pupil to assist him in investigating the cause of death in a patient, aged twenty-eight, who suddenly expired immediately after having given birth to her fourth child. She had been for three or four years subject to violent palpitations, and much difficulty of breathing, on the least exertion, even walking slowly up stairs; she had constant cough, and occasionally expectorated small quantities of blood. My friend was not called until the os uteri was entirely dilated; the labour was unusually easy; the child was born an hour after he entered the room; and the same pain which expelled the breech, also threw off the placenta. She appeared not to have suffered much from fatigue, and inquired concerning the sex of the child. While, however, her attendant was tying the funis, he observed that she was attacked with a slight convulsion; and before he could get round to the side of the bed near which her head lay, she had ceased to breathe. The uterus was firmly contracted, and contained a very small quantity of coagula; the viscera of the abdomen were remarkably healthy; the lungs were healthy in structure, but gorged with blood; the heart was small, and very flaccid; the mitral valve was much thickened, and the communication between the left auricle and ventricle would only just admit the end of the little finger. There were about five ounces of serum in the pericardium. These cases would teach us to watch a patient narrowly under labour, in whom there had previously existed any symptoms of organic disease either of the heart, the lungs, or, indeed, of any other organ connected with the respiratory or circulating systems.

and death occur quickly after the process of labour had been naturally completed, when there was no hæmorrhage to account for the fatal result, and when dissection neither discovered any organic disease, nor threw the least light on the immediate cause of dissolution.

Such attacks of syncope most frequently follow rapid labours; and patients of a relaxed fibre, whose minds possess a gloomy turn,—especially those who have entertained deeply-rooted apprehensions with regard to their recovery,—are most usually the subjects of this dangerous affection. My father states, that it is observed more frequently when the child is still-born, and refers it partly to despondency, the consequence of such an aggravated disappointment.* The liberal admission of fresh air, placing the head and shoulders rather below the level of the other parts of the body, the exhibition of repeated small doses of stimuli, the application of warmth to the extremities, abdominal friction, and especially the adaptation of a properly contrived broad bandage, girt tightly round the person, seem to offer the most effectual means of restoring the tone of the circulating system.

7th. LABOURS COMPLICATED WITH PROLAPSUS OF THE FUNIS UMBILICALIS.

Prolapsus of the funis umbilicalis by the side of the head, Plate L. fig. 138, or breech, sometimes occurs during labour. The loop, however, cannot descend until after the membranes have ruptured; and usually it passes down the moment the liquor amnii is evacuated. The longer the cord is, the more likely is this accident to happen; and should it have gravitated to the os uteri, and collected there in a fold, it is scarcely possible to prevent the coil being carried down into the vagina by the rush of the escaping fluid.

Such an occurrence brings with it not the least danger to the mother;—the labour goes on as well as if it had not happened; for since the space occupied by the fallen funis is most inconsiderable, it cannot impede the regular advance of the process. But the child must always be placed in greater or less jeopardy; the peril is generally extreme, and entirely dependent on pressure. Since the life of the fœtus is sustained by the circulation through the cord, any interruption to the free passage of the blood must produce hazard; and if it be suspended for any length of time continuously, death will ensue, as surely as if breathing were prevented after

* Pract. Obs., part i. p. 207.

Fig. 138.

Pl. L.

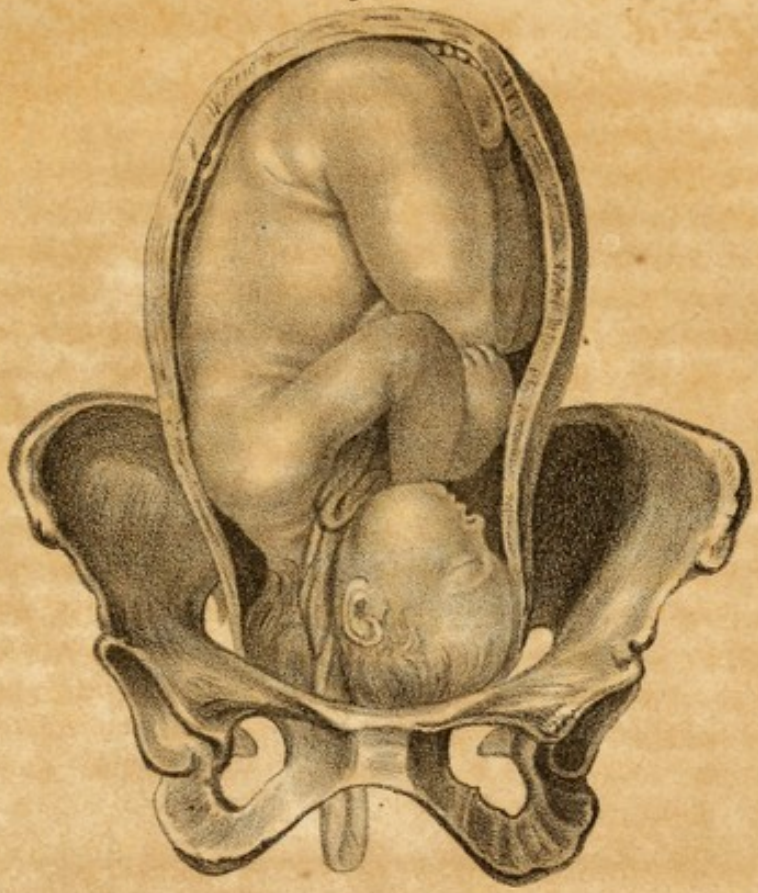


Fig. 139.



Sinclair's Lith.

birth;* and it therefore becomes a matter of great moment that we should adopt some plan for its preservation. Not that it is absolutely necessary the fœtus should perish because the funis prolapses; but the chances are much against its being born living, unless means are taken to protect it.†

Diagnosis.—There will be no difficulty in detecting the cord hanging in the vagina. By its softness, smoothness, and roundness, and particularly by its pulsation,—should the circulation be still carried on,—it may be distinguished both from any part of the child, as well as from any of the maternal structures.

Treatment.—If the pulsation have entirely ceased for some time,—especially if the cord be external, and have become cold and flaccid,—there can remain no doubt of the child's death. The continuance of the funis in the vagina is, under such circumstances, of no importance; and the labour may be allowed to proceed uninterfered with. But if the arteries be still beating, whether in a natural manner or more feebly, it is right that we should attempt to guard the vein as well as them from the pressure which they must more or less experience before the birth is perfected.

With this intention, four methods have been proposed:—carrying the prolapsed cord to that part of the pelvis where there is not room, and where it will be most out of the way of injury;—turning the child, and delivering by the feet;—returning the funis, and keeping it above the presenting part until the fœtus is partly in the world;—and delivering by the forceps as early as practicable.

It will seldom be possible to preserve the funis from pressure by carrying it to one or other side of the pelvis; for the volume of the fœtal head is so nearly adapted to the capacity of the pelvic cavity, as to leave but little space unoccupied. This mode of proceeding, then, is very unsatisfactory, because but of partial benefit; and in few cases can it be trusted to. Turning the child, and delivering by the feet, has received the sanction of most obstetrical authorities of the present day, provided the presence of the funis at the os uteri be discovered before the membranes break, or it prolapse while the head remains entirely above the brim; the os uteri being in a dilated or easily dilatable condition. Thus Denman‡ counsels us, "if the child be living, and the presenting part remain high up in the pelvis,—especially if the pains have been slow and feeble,—it will generally be

* Mauriceau (Maladies des Femmes Grosses, livre ii. chap. xxvi.) supposed the exposure of the funis to the cold air occasioned the child's death; but this is evidently erroneous.

† Collins (p. 346) states, that out of ninety-seven cases of prolapsed funis which occurred in the Dublin Lying-in Hospital during his mastership, twenty-four children were born alive; and of sixty-six during Dr. Clarke's, seventeen were born alive.

‡ Chap. xviii. sect. 3.

better to pass the hand into the uterus, to turn and deliver by the feet, using, at the same time, the precaution of carrying up the descended funis, that it may be out of the way of compression." But he afterwards utters a sentiment which would render the instruction just quoted almost a dead letter, in these words: "No attempts to save the child are on any account to be made, but such as can be practised without *the chance* of injuring the mother."*

Burns † says, "As soon as the os uteri will admit the introduction of the hand, the child should be turned;" but if the presentation be advanced before we are called, he recommends "removing the cord to that part of the pelvis where it is least apt to be compressed;" or what is still better, pushing it above the head, because "this is less violent, and safer, than attempts to turn in an advanced stage of labour." Dewees ‡ tells us, if the cord prolapses, "turning may be had recourse to—1st, When the uterus is sufficiently dilated or dilatable for the operation; 2nd, When the head is still enclosed in the uterus; 3rd, When there is no deformity of pelvis to defeat the object of the operation." Gooch,§ after premising that we are not justified in adopting any measure which will endanger the life of the mother, adds, "If we detect a presentation of the funis when the os uteri is nearly dilated, the membranes entire, and the parts in a relaxed state, no one would here hesitate to turn and deliver, as it may be done with ease and safety." Campbell ‖ thinks," that of all the methods proposed for managing these cases when the passages are prepared, or when the labour is not too far advanced, turning is decidedly the most proper; but this practice is not unexceptionable." Hamilton ¶ supposes we are bound to turn, if we detect a presentation of the funis before the membranes rupture; but that we are not warranted in doing it afterwards.

I have thought it right to cite the opinions of these eminent practitioners at length, because they are at variance with my own, and because I wish to put the case as fairly before the student as I can. No argument that I have ever heard has inclined me to adopt their practice as a general principle; and I perfectly agree with Baudelocque,** that "although the accident is dangerous, the precept of delivering instantly, by turning the child, if adhered to indiscriminately, is not less so." He advises, that nothing should be done until we ascertain what course nature is likely to take, and the degree of compression the umbilical cord is suffering; for he thinks that the natural expulsion is often more rapid than the extrac-

* Sect. 4.
† Princip. of Mid. p., 388.
‡ System of Mid., p. 262.
§ Compend. p. 239.
‖ System of Mid., p. 320.
¶ M S. Lect. 1821.
** Parag. 1122, transl.

tion could be. Conquest* seems adverse to turning under these circumstances; nor does Blundell† nor Collins‡ sanction the practice. Merriman§ states, that turning can only be resorted to under a combination of the four following circumstances:—pulsation in the cord, proving the life of the child; its head not having yet entered the pelvis; the pains not being strong; and there existing a relaxed state of the external parts, to admit of the ready extrication of the head; and indeed, if delivery by this means is ever undertaken, Merriman's judicious rules should be rigidly adhered to. I would even venture to add, that under this favourable state of things, no man would be justified in terminating the labour manually, unless he had acquired by practice some experience in the operative department of his profession.

The objections which I take to this mode of proceeding depend partly on the hazard in which the mother must be involved, under every case of turning, however favourable the attendant circumstances, and however skilfully the operation is performed; and partly on the danger which the child must suffer from compression of the umbilical cord itself during the passage of its shoulders and head through the pelvis; and this danger will be extreme if the pelvis be of small dimensions, or the soft parts preternaturally rigid.

The practice I would recommend for the adoption of the young surgeon, provided the subsidence of the funis be discovered before the membranes break, is to keep the patient perfectly quiet in one posture,—to prevent her moving off the bed,—to caution her strongly against exerting her voluntary efforts,—not to leave the chamber on any account,—and to be most careful in preserving the bag of membranes perfect. The moment it has ruptured, to introduce two or three fingers of the left hand, or the whole hand, if necessary, into the vagina,—to carry the loop up above the presenting part of the head,—and to retain it there until the next pain comes on, in the hope that the head will be propelled somewhat downwards, while the funis remains above. Should it, however, again descend, another attempt may be made; the fingers need not be withdrawn until two or three pains have been suffered, and it is quite probable that the head will then have passed down so low as to preclude the likelihood of the cord again prolapsing. We shall often, however, be disappointed by the loop again appearing as soon as we remove our fingers: if that should be the case after the cord has been returned, a small piece of soft sponge, as advised by Hogben‖ and Hopkins,¶ may be introduced, to act

* Outlines, 1837, p. 135.
† Obst. by Castle, p. 610.
‡ Pract. Treatise, p. 344.
§ Synopsis, p. 96.
‖ Obstetric Studies, p. 62.
¶ Accoucheur's *Vade Mecum*, p. 193.

as a stay on which it may rest. This mode of proceeding I have two or three times found efficacious; and both Gooch and Blundell have succeeded in saving the child by such means.

Mauriceau* did not overlook this cause of danger to the fœtus, and he recommended that the descending loop should be passed up by the end of the fingers; and if it would not remain above the head, but descended again as soon as the hand was removed, that a piece of soft linen should be introduced on which it might rest; that another piece of linen steeped in warm wine should be carried up to the mouth of the womb, to prevent the funis becoming chilled; and if these means do not succeed in preserving the cord above the head, to turn the child with great care, and deliver by the feet, provided that operation could be accomplished without endangering the mother. Dr. Colin Mackenzie† wrapped the prolapsed fold in a leathern purse, with a mouth that closed by a running string, and carried both within the uterus together. This last method possesses no superiority over the piece of sponge; and it is not impossible that the vessels of the funis might be so compressed by their envelope as to suspend the flow of blood through them. The late Sir Richard Croft, knowing the difficulty of preserving the coil of cord above the head, advised that it should be carried by the hand into the uterus, and suspended on a limb, which would effectually prevent its future descent. He published two cases,‡ in which he practised this method successfully, and informed Dr. Denman that he had also met with others equally fortunate. His suggestion, however, has not been generally followed; and I cannot myself recommend it because of the difficulty of accomplishing the object, and because there must always be some risk to the mother in the introduction of the hand within the uterus. The passing the hand into the uterine cavity, indeed, is never to be adopted without grave occasion, and a tolerable certainty of being able to accomplish the end for which it was undertaken.

Should the membranes have broken some time before the patient is first seen, the same means will avail, if the head be still above the pelvic brim. But if it have descended within the scope either of the long or the short forceps, and the pulsation in the umbilical arteries be quick, weak, and intermittent, (particularly if it should be suspended during each uterine contraction,) while the progress of the labour is slow, one or other of these instruments may be employed to facilitate the birth.§ In their application, however, we must be extremely careful that the funis is not pinched between the head and the blade, else we shall run into the very danger

* Livre ii. chap. xxvi.

† Denman, loco citato.

‡ Lond. Med. Journ., 1786, page 38.

§ All the authorities I have mentioned advise delivery by the forceps if the head is in the pelvis, the labour progressing slowly, and the soft parts relaxed.

we seek to avoid, and our interference will be highly injurious, instead of useful. The extraction must be as rapid as is consistent with the mother's safety.

It is always desirable, when the funis descends, to inform the patient's friends of the great probability existing that the child may be born still, and to require that the common means for its resuscitation should be in readiness on its expulsion; and if she herself is inquisitive about the extraordinary attention we think it necessary to pay her, we may candidly confess to her that the navel-string has fallen down; and add, that the accident does not in the least endanger her safety, but that our solicitude is for the preservation of her babe.

If the funis prolapse by the side of the breech, and the vessels be suffering compression, traction may be made to terminate the labour more speedily; and if it pass down while the child lies transversely, turning must be had recourse to;—the operation being undertaken, not because the cord descends, but because of the unfortunate situation of the infant.

8th. LABOURS COMPLICATED WITH DESCENT OF THE HAND BY THE SIDE OF THE HEAD OR BREECH.

Descent of the hand by the side of the head or breech is another complication of labour, by no means so serious as the case last considered, but which occasionally is productive of much embarrassment. One hand only may prolapse, Plate L. fig. 139, or both may at the same time descend. It is owing to the original position of the fœtus in utero. I have already shown that the most usual situation of the arms is their being crossed upon the chest; but that sometimes one, and occasionally both, are placed against an ear: and when this is the case, on the evacuation of the liquor amnii the descent may take place.

Though not dangerous to the life either of the mother or her offspring, this accident is in a degree unfortunate for both;—for the mother, because the hand occupies a certain quantity of space, and may therefore proportionably retard the labour;—for the fœtus, because the pressure on the cartilaginous structure of the wrist may so injure the limb as to be of serious eventual consequence; and this especially if both prolapse. I have not myself, however, in any case seen much injury result.

It is not difficult to detect the hand at the brim of the pelvis, even before the membranes break. There is no part of the body with which it

is likely to be confounded, except the foot; and the marks I have before enumerated (p. 306,) will, if borne in mind, be sufficient to distinguish the one limb from the other.

Treatment.—I have before directed that, whenever the hand was detected at the os uteri, an accurate examination should be instituted to determine, as soon as possible, whether the shoulder was above; or whether the head or some other part was presenting; because our treatment entirely depends on the information we then acquire. Thus, if the shoulder present or the fœtus lie otherwise transversely, turning must be had recourse to, which operation is not necessary if either the head or the breech offer themselves to the finger. Should the case prove such as we are now considering, our duty is to keep the prolapsed limb above the presenting part, that as little impediment as possible may exist to the easy expulsion of the fœtus. With this view, on the rupture of the membranes, the fœtal hand may be embraced between the first two fingers of our left hand, and returned without force or violence within the os uteri: it may there be kept until two or three pains have propelled the head sufficiently low to preclude the probability of a fresh descent. If we withdraw our fingers immediately we have passed it up, the next pain will again protrude it, and we may find it requisite to return it many times. Should we be foiled in keeping it out of the way in this manner, a piece of sponge may be used, as recommended when the funis prolapses; and if it gives us continued trouble, rather than irritate the vagina or os uteri, we had better allow it to remain down, and take the chance of its being slightly swollen. It is not necessary to deliver instrumentally, merely because the hand is in the vagina; but if the pelvis be narrow in its diameter, and especially if both hands are protruded, so much room may be occupied by them as materially to interfere with the easy passage of the head; and such symptoms of exhaustion may possibly be induced as will require the application of the forceps, or even the use of destructive instruments, to terminate the labour.

I am pretty well persuaded that many of those cases which we sometimes hear of, where the fœtal hand presents in the vagina, and it is supposed that the shoulder has been raised, and the head brought to the pelvic brim, have been mistaken, and that the child did not originally lie transversely, but that the presentation was the hand by the side of the head. I have myself more than once heard the ease with which this evolution could be effected mentioned, and the superiority of this mode of *turning* over that commonly practised,—and which, indeed, I have recommended,—strongly insisted on; and I have always suspected some error in the diagnosis: for I know by experience how difficult it is to push up the

shoulder, and bring the head to the os uteri, when the membranes have been some time ruptured.

By referring to Plate XLIV, fig. 127, it will be perceived how easily a simple case, such as I am now describing, might be converted into one of the most difficult in obstetric surgery; for if the hand be brought fully down, so as to appear externally, under the supposition, for instance, that it was a foot, the head will very likely be canted over one ilium, the shoulder and chest will be impacted in the brim of the pelvis, and a transverse presentation will be formed, which will require the introduction of the hand, and the version of the fœtus, before the labour can be completed: and this should be an extra warning to us perfectly to assure ourselves of the position of the child before we interfere by traction at a limb.

9th. MONSTERS.

The development of those irregular formation termed Monsters offers many curious objects for physiological speculation, and some of interest also to the practical obstetrician: in both of these points of view, therefore, the subject deserves from us a little consideration.

Varieties.—The word, in itself not perhaps the most appropriate that could be chosen, has very improperly been applied to the subjects of disease, such as appears occasionally in after life. Thus the hydrocephalic fœtus is by some considered as a *monster*. If used at all, however, it should strictly be confined to those instances in which some great deviation from normal structure is observed, either as the result of original natural formation, confusion of the organs of two separate children, or irregular or diseased action of a specific kind, such as can only exist in, and influence the organization of, the fœtus in utero. Buffon's arrangement is the most simple, as well as natural. He divides these productions into four varieties;—1st, those in which there is a deficiency of parts; 2nd, those which are redundant in organs; 3rd, where the parts are misshapen; and 4th, where, although the organs may be naturally formed, they are misplaced.

1st. *Deficiency of Parts.*—Of all the irregularities of monstrosity, instances in which there exists a deficiency of parts are most commonly met with; and this deficiency may exist in many organs. Among those that can be brought under the examination of the eye, the mouth and lips are perhaps most frequently the seat of this anormal development. Sometimes there is a simple fissure in the upper-lip, forming the single hare-lip; at other times there is a double fissure, and a want of a greater

or less portion of the palate; sometimes, again, the palate is faulty, while the lips are perfect. Not unfrequently, also, there is some imperfection in the genitals. The anterior part of the bladder and the parietes of the abdomen, just above the pubes, have been found wanting; so also has a portion of the muscles and integuments round the navel. In the former case, the mucous lining of the bladder is continuous at its circumference with the skin, and forms a soft, red, sensitive protuberance in the pubic region; the ossa pubis do not meet, and the recti muscles are separated to some extent. Such an extensive malformation could not exist without disturbing the arrangement of the genital organs. In the latter, the intestines in the neighbourhood of the umbilicus appear to have no covering but the peritoneum, and the chorion and amnion continued from the placenta. Often a large portion of the bowels is received into the cord itself; and cases are on record in which the whole contents, both of the abdomen and chest, were without the protection of their usual parietes. The septum between the ventricles of the heart, and occasionally the diaphragm, have been deficient, or imperfect. Sometimes one or both arms, at others the legs, are scarcely formed at all; and when this is the case, Nature seems to make up for the deficiency by granting an extra growth to other parts; thus, in a fœtus preserved in the London Hospital Museum, the head and trunk are nearly twice the natural size, while the arms and legs are not more than three inches long. A want of the spinous processes of three or four contiguous vertebræ, is not a very uncommon specimen of monstrosity. This constitutes *spina bifida*. There is usually a soft fluctuating tumour in the situation of the malformed bones, caused by water contained within the sheath of the spinal marrow. A midwife under my superintendence delivered a woman, a few years since, of twins, each labouring under spina bifida situated low in the lumbar vertebræ.

But the most interesting and singular variety of deficient organization is exemplified in what is denominated the *acephalous* monster. In this there is a total want of the bones at the side and upper part of the cranium, as well as of the brain and the membranes ordinarily covering it. The *basis cranii* is ill-shaped, and covered by a membrane continuous with the integuments. There is no forehead, but the skull runs backwards from the superciliary ridge. Sometimes, under the membrane at the base of the skull, there is a quantity of soft pulpy matter; but more frequently the spinal marrow commences, as it were, abruptly. The preparations of the acephaloid fœtus (which have been multiplied *ad infinitum*, and specimens of which may be found in every museum,) prove that the case is by no means very rare; and they show also that the brain is not essential to our being while in utero: for many of these children have arrived

at the full intra-uterine size—nay, some are actually larger than an ordinary fœtus; as if nature had intended to compensate for the loss of the brain by allowing an exuberant growth to the body. In these instances the nerves are well formed, and even those of the senses which ordinarily terminate in the cerebral mass itself—such as the optic—are not wanting. Acephaloid children have been known to live some hours, and even days. I myself saw one alive thirty-six hours after its birth, which cried, (though feebly,) sucked, and seemed to perform all the animal functions much more perfectly than could have been supposed. The spinal marrow has been found wanting in some cases, when the brain was deficient. There is a woman now living in Double X Place, Globe Road, Mile End, who has had six children, and each alternate one has been acephalous, the others healthy, and born living. It has been observed by her attendant, that with each of the monstrous fœtuses there has been an excessive qauntity of liquor amnii; not so, however, with the others.

2nd. *Redundancy of parts.*—Organs are not unfrequently redundant: thus occasionally there are supernumerary thumbs, fingers, or toes; such an irregularity being sometimes confined to one limb, sometimes affecting all. It is evidently both erroneous and unjust to call a child a monster, merely because it possesses a toe or a finger more than the natural number; for the very word conveys a horrible, or at least an unpleasant, impression. It is worth remark, that this deviation from natural formation sometimes runs in families. Meckel (Pathol. Anatomy, vol. i. p. 19) has observed this; there is a curious case of the same kind in the fourteenth volume of the Medical Gaz., p. 65; and two similar instances have come under my own eye. In the year 1831, two children were brought to my house, twin boys, of a fortnight old, one of them with a supernumerary finger and toe on each hand and foot, the other with only one extra finger on the right hand; the toes had apparently well-formed joints, by which they were connected to the metatarsal bones; the fingers merely hung by a pellicle of skin. I saw the mother afterwards, and found she had a supernumerary finger and toe on each hand and foot, with perfect joints, and capable of motion. She told me she had borne twenty-one children —that all the girls but one were born with extra fingers and toes; but only one of the boys besides the twins was affected in the same manner. She also said her mother and one of her sisters were the subjects of the same kind of irregularity. The other case much resembled this.

Sometimes a larger and more important member than a finger or toe is supernumerary. Thus Sir E. Home has described, in the 80th volume of the Philosophical Transactions, an Indian child which had two heads, united together at their crowns,—the upper one being inverted. The subject died of the bite of a rattle-snake, when it was above four years

old. It was found that the two skulls were nearly of the same size—equally complete in ossification. "The frontal and parietal bones, instead of being continued over the top of the head, meet each other, and are united by a circular suture. The two skulls are almost equally perfect at their union; but the superior skull, as it recedes from the other, becomes imperfect, and many of its parts are deficient. The number of the teeth is the same in both. There is no septum of bone between the crania, so that the two brains must have been contained in one bony case." The dura mater of each, however, was continued across, so as to divide the cerebral masses from each other, and their membranes were perforated by a number of large vessels by which the upper brain was nourished. The skull was deposited in the Hunterian Museum, and is now in possession of the Royal College of Surgeons.

In the lower animals, monstrosities occur much more frequently than in man; and the domesticated are more obnoxious to these irregularities than those in the wild state. Monstrous pigs, sheep, puppies, kittens, ducks, and chickens, are to be seen in every collection of specimens devoted to the elucidation, of the subject of reproduction.

Two children have been joined together by the back, the sides, and by the sternum and abdomen. Plate LI, figs. 140 and 141, the originals of which are in the London Hospital Museum, show the possibility of such a confusion. Nor are such specimens by any means singular; but many similar are preserved. Instances, indeed, are not wanting, of individuals variously connected by nature, surviving their birth, and even living to maturity. The far-famed Hungarian sisters, who were born in Szony, on October 26, 1701, and exbited in most countries of Europe, form an instance in point. These girls were united at the lower part of their loins and sacra; but instead of standing back to back, the faces and bodies were placed half sideways, in regard to each other. They had but one anus and one vulva; their viscera were all double, except that the two vaginæ united at their extremity, and the two recta had a similar arrangement. They were not equally strong, nor of equal plumpness, and were separately affected by hunger and the calls of nature; one was more sickly than the other, and often suffered convulsions, while the other was well. One often slept while the other was awake. They lived till they were nearly twenty-two years old, and menstruated at different times. They died almost at the instant.

We have lately, in Britain, had an opportunity of seeing an example somewhat analogous to the sisters of Hungary, in the persons of the Siamese twins, who were born in May 1811, and exhibited here in the year 1829. These boys were connected by a band about four inches long and eleven in circumference, situated at the lower part of the sternum, in-

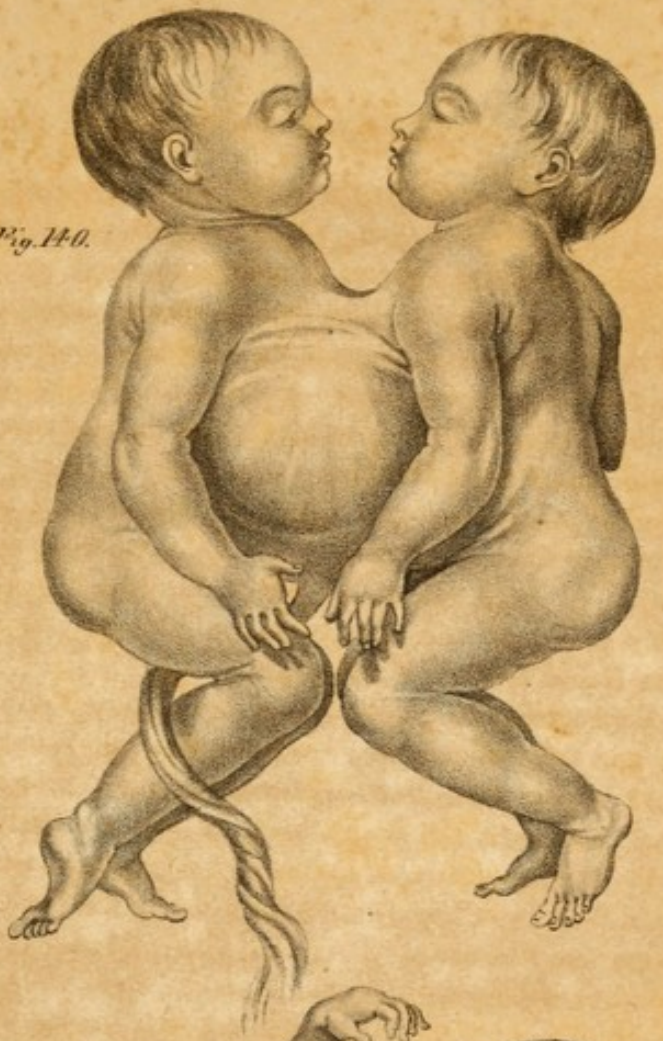


Fig. 140.



Fig. 141

Sinclair's Lith.

volving the ensiform cartilages, and possessing at its lower face an umbilicus. The length of the band allowed them to turn a little sideways toward each other. Their nervous systems seemed to act more in unison than in the case of the sisters; for they both slept at the same time, and one could not be awakened without rousing the other; their pulses were not always alike. Hunger affected both simultaneously; they both preferred the same kind of food, and were both satisfied with nearly the same quantity, and at the same time. But the vascular systems were distinct, or had but slight communication; for asparagus eaten by the one did not impregnate with its peculiar odour the urine of the other; and not the least pulsation could be distinguished in the band. Three or four other cases of double fœtuses, who lived for different periods, are on record.

Instances also are recorded of the union of a perfect with a partially developed body, of which A-Ke, a Chinese, sixteen years old, may be adduced as an example. He had the loins, nates, upper and lower extremities, of a small parasitical brother escaping from the abdomen between the umbilicus and the sternum. This prodigy, I believe, was shown in England some years ago, and small models of his person must be familiar to every one who has had the curiosity to inquire into this subject. Another case very similar to the last is related by Ambrose Paré, whose testimony, although he deals in many most marvellous stories, is, in this instance, at least, not to be treated lightly. The man exhibited himself in Paris in 1530, was forty years old, and had growing out of his abdomen a smaller body, perfect in all its parts, but wanting the head and shoulders. Paré has given a drawing of this, as well as many other monstrous productions, some highly probable, but most of them absurd, and perfectly incredible;—and Palfyn gives the history of a man having a small body attached in the same way; in this instance, also, there were arms external, and the head only was wanting. Winslow relates that he saw a girl of twelve years old, well formed, and of the common size, with the abdomen and lower extremities of another body hanging from the left side of the epigastric region; and in the 79th volume of the Philosophical Transactions there is the account of a well-made Gentoo boy, who had the pelvis and lower limbs of a little brother suspended from the pubes.

Rueffe, Paré, and Palfyn, all speak of a man, alive in 1519, from whose abdomen a small though well-formed head appeared to grow; and Winslow saw, in 1698, an Italian, who had another head, much less than his own, connected to the chest below the cartilage of the third rib. The man felt any impression on this *extra* head.

Bartholin, who saw the person, and Zaccias, relate the case of an individual named Lazarus Colloredo, æt, 28, of common stature, and well

formed, who had a deformed, twin brother, John, hanging by the chest from the lower part of the sternum. His head was larger than that of Lazarus: he had two arms, with three fingers on each hand, but only one lower extremity. Respiration was hardly perceptible, but there was evident pulsation in the thorax; he was nourished by the food taken in by Lazarus.

Again, an imperfect body has been found entirely enclosed within another. In the Gentleman's Magazine for December 1748, mention is made of a child born with a large bag extending from the perineum to the toes, which in a few days burst, and a mass of florid flesh protruded, in which were distinctly perceptible a hand and foot, with perfect fingers and toes; but no organs could be traced, or any rudiments of either sex. Richerand mentions a lad named Bissieu, who died at thirteen years' old, and who, from his earliest infancy, had a tumour on the left side of the lower part of his abdomen, which was very painful. He was seized with fever and increase of pain in the prominent part, and voided by stool purulent and fœtid matter, and a ball of hair; after which he soon sank. The tumour was found to consist of a cyst, having a recent communication with the transverse colon, and containing the rudiments of a fœtus. There were discovered a brain, spinal marrow, very large nerves, muscles, and the skeleton of the head, vertebral column, pelvis, and imperfect limbs, with a short umbilical cord attached to the mesocolon. No organs of digestion or respiration, urinary or generative, could be found. The case was drawn up at length by M. Dupuytren; and drawings were made by MM. Cuvier and Jadelot; and a detailed account was published in the "*Bulletin de l'Ecole de Médecine*," "*Gazette de Santé*," 1804, and some other works of the period. A somewhat similar case was published by Mr. George Young, in the first volume of the Medico-Chirurgical Transactions; it was of a child whom he saw frequently during life, in consequence of a tumour in the abdomen, which gradually increased till his death; he survived nine months. A cyst was found occupying a large portion of the abdomen, which contained four pints, fourteen ounces, of greenish limpid fluid, and an imperfectly formed fœtus adhering to it by a conical process arising from the umbilicus. The surface was covered with that sebaceous matter so usually found on the skin of infants at birth; and the skin itself was rosy, and of a healthy look. The extremities were distinct, but short and thick; the fingers and toes were furnished with nails; there was a well-formed penis, and a cleft scrotum. There was no brain, nor spinal marrow, nor diaphragm; neither heart, nor liver, nor urinary organs, nor any internal organs of generation. Scarcely any muscular fabric was discovered in the whole mass. The alimentary canal was the most perfectly formed of the internal organs; a part of the

intestines, indeed, was in all respects naturally constructed. Mr. Highmore, a surgeon of Sherbourne in Dorsetshire, opened the body of a boy named Thomas Lane, between fifteen and sixteen years old, in June 1814, in which he found the rudiments of a human fœtus. The two last-mentioned specimens are preserved in the Museum of the College of Surgeons.

In *l'Histore de l'Académie Royale des Sciences*, vol. ii. p. 298, 1733, there is an account given by M. de Saint Donat, a surgeon at Sisterton, of a fœtus found in the scrotum of a man. And Velpeau presented to the Paris Academy, in 1840, a preparation of the rudiments of a fœtus —the whole mass being as large as a doubled fist—which he had removed from its connexion with the right testicle of a man, æt. 27, named Gallochat. The tumour had existed from his birth, and had increased up to the time when he was three or four years old.—(See *Gazette Médicale*, Feb. 15th, 1840; copied into the *London Medical Gazette*, March 13th, 1840.)

Parts misshapen, though properly situated, are by no means uncommon; sometimes this unnatural formation is the result of defective, sometimes redundant organization; thus the different features of the face may be malformed; the scrotum is sometimes cleft; the urethra and rectum imperforate. Club feet are usually classed among this variety of monstrosity; but it appears to me that they often owe their origin to accidental causes rather than natural formation. The distortion may not unfrequently arise from the limb being cramped in utero, owing, perhaps, to the awkward position in which the child lies, or to there being but a small quantity of liquor amnii.

Misplacement of perfectly formed parts is the least common of all kinds of monsters. I do not know that, even among all the extravagant stories in the older works, there is any account of a well-formed arm arising from the pelvis, or a leg from the scapula; and we should certainly not give credence to it, were we to meet with such a tale. But the viscera have been transposed; and such a case may be considered a monstrosity of of this description. The most perfect on record, perhaps, is given by Dr. Bailie, in the *Philosoph. Trans.*, vol. lxxviii., for 1788. A fœtus with the heart on the right side, and other viscera transposed, is preserved in the London Hospital Museum; the subject was in other respects misformed.

It may be thought a needless waste of time to enter so much at large upon subjects from which no practical good appears likely to result; but its interest has seduced me into these details. Besides, by studying nature in her imperfections and irregularities, we are more likely to arrive at some knowledge of her laws, than if we regard her only in her healthy condition. By learning what parts she can dispense

with, we ascertain those organs essential to existence; and by tracing the deviations from her common course, we may perhaps be hereafter led to a more correct acquaintance with her *methodus agendi.*

Origin.—It is not my intention to endeavour to account for the origin of monstrous formations; but I may cursorily state, with regard to deficient and redundant monsters, that some suppose the germ, before impregnation, is improperly formed; others, that it is an undue admixture of prolific particles at the moment of fecundation; others, that monstrosity has taken place after conception, owing to some irregular vascular excitement, or deficiency of nourishment;—thus the vessels of the redundant part being more numerous, and more active than they ought to be, produce an excess of growth, whilst those of the deficient part are just in a contrary condition. Where a connexion of two children, nearly or quite perfect, exists, I cannot help thinking that union takes place not only after fecundation, but after the fœtuses have grown to a certain size. In the case of the Siamese twins, or the original of fig. 140, Plate LI., I presume that they were originally true twin conceptions, but that the membranes which ought to have enveloped each body, so as to form an inseparable barrier between them, were imperfect, and that, in consequence, the bodies were allowed to come into close contact with each other; that there is such a strong formative power existing in the vascular system of the fœtus, that when the two cuticular surfaces came together, vessels shot from one to the other, and the parts became permanently united by adhesion, in the same way that two fingers would coalesce, provided the skin was removed and they were kept in apposition. We know that sometimes twins are contained in the same bag of membranes, and in such case, provided they lay for any length of time in contact, we may believe it quite possible for a junction of the two bodies to occur.

Richerand tells us, "by placing in a confined vessel the fecundated ova of a tench, or any other fish, the numerous young ones which are formed, not having space sufficient for their growth, adhere to each other, and fishes truly monstrous are produced." And in the vegetable kingdom it is not very unusual for two fruits, in contact and cramped in their growth, to unite indissolubly.

Treatment.—In regard to the management of these anomalous cases, which is the chief point of interest to the obstetrical surgeon, I have little to offer. It is very possible we might be deceived in mistaking the presentation of the head of an acephalous child for some other part, or we might be quite at a loss to make out what it was. Under such circumstances, as accurate an examination as possible of all the body within reach should be instituted, and probably one or other of the features might be felt, which would lead us to a correct diagnosis. If the fœtus

be deficient in the size of any part, or in its members, without a correspondent enlargement of bulk in other organs, no interference can be required, provided the pains be strong, and the pelvis sufficiently roomy; but if it be double, Plate XLI. fig. 140 and 141, or excessive in development, the common principles before laid down must guide us. The varieties of monstrous formations in excess are so many and diversified, that it is utterly impossible to lay down rules to meet all exigencies. The conduct of the case, therefore, must be left entirely to the judgment of the practitioner; and the welfare of his patient will depend on the correctness of the views he has formed of natural and instrumental delivery, and on the dexterity he may have acquired by practice.

10th. LABOURS COMPLICATED WITH PLURAL BIRTHS.

Women, although usually uniparient, like other uniparient animals, sometimes produce more than one offspring at a birth; and when the gestation is plural, twins are by far the most frequent.*

It is popularly supposed that climate, and the state of civilization to which the country has advanced, exert an influence on the multiplication of the human species; and that certain external circumstances are favourable or otherwise to the frequent production of twins; but this is by no

* The average of twin cases varies considerably in different parts of the world; and we find also no little difference in the tables kept by separate individuals in the same country. Thus Denman shows that in the Middlesex Hospital in this metropolis one occurred in about every 95 labours; in the London practice of midwifery the estimate is stated as one in 48; Conquest considers it one in 90; Gooch, one in about 70; Blundell states, that from the statistical accounts transmitted to government in the year 1801, it appeared that in these islands one in 65 was a twin case. Bland in London, and Boer at Vienna, found the average one in 80; in the Maternity at Paris, one was met with in 88; in the Maison d'Accouchemens, one in 91; Mad. Boivin met with one only in every 132; Dewees averages the frequency in North America as one in 75; Dr. Arnell's average is also one in 75; Dr. Moore's, one in 76. From Collins' table, of 129,172 women delivered in the Dublin Lying-in Hospital, there were 2,062 cases of twins, being one in about every 62 labours; 29 of triplets, or one in 4,450 and one of quadruplets. From tables which I have myself kept, I find that out of 29,489 cases that occurred in the Royal Maternity Charity, from January 1st, 1828, to December 31st 1840, there were 318 instances of twins, or one in nearly every 93 labours. Of these, 114 were of different sexes; 93 were both boys; and 111 both girls;—141 of these children presented both with the head; 131, the head and breech, or lower extremities; 29, both breech or lower extremities; 14, one head, one transversely; 2, one breech, the other transversely; and in one both presented transversely. It is curious, too, that when the children were of different sexes they mostly presented with the head and breech. Triplets are generally supposed to be met with once in about 3 or 4,000 labours; and the returns from Dublin would lead us to believe that estimate tolerably correct; but I am inclined to think the frequency of these cases generally much overrated, for out of these 29,489 births there was but one case of triplets. Quadruple cases are so rare as to defy any thing like an accurate calculation.

means proved; although we know that some animals, the sow for instance, farrow more young at a birth, and also more frequently, when domesticated, than when in a state of nature. Dewees* says, that if the various tables can be relied on, it is certain "there are conditions and circumstances which give rise to more double births" in America than Europe; while Collins† remarks, "it is singular that in Ireland the proportional number of women giving birth to twins is nearly a third greater than in any other country from which I have been able to obtain authentic records."‡

It is also a belief that preternatural fecundity is, to a certain extent, hereditary; and Dewees states, that "some facts within his own knowledge would seem to countenance this supposition: but they are not sufficiently numerous or strong to confirm it." He looks upon it, however, as in some instances constitutional, and adduces the case of a woman, whom he knew, that five times produced twins, and never had a single child; and another who thrice brought forth twins, though not consecutively.§

It has been observed, indeed, that some seasons appear more prolific than others, as well in the human race as other productions of nature; but whether this is quite accidental, or dependent on some fixed laws, is not easily determined. Denman thinks "it can scarcely be doubted that there is some relation in those years between the animal and vegetable creation."

Rare as instances of quadruplets are, the prolific powers of the human female are not even limited to the production of four children at a birth. In the Museum of the College of Surgeons in this city, there are five fœtuses preserved which were expelled at one birth, under the care of the late Dr. Hull of Manchester; they had advanced to five months intra-uterine age.‖

In the London Practice of Midwifery, which is a copy of the late Dr.

* Parag. 1321. † Pract. Treatise, p. 309.

‡ I have heard these two opinions, apparently contradictory, attempted to be reconciled by the explanation that a large proportion of the first European emigrants to America were from the Emerald Isle. Denman, too, (chap. xvii. sect. 1,) thinks climate and the state or degree of civilization have their influence over the fecundity of human beings.

§ Gottlob mentions one who in three births produced eleven children.—(Elliotson's Notes to Blumenbach, p. 487.)

‖ There are several other well-attested cases of five children at a birth. One will be found in the Gentleman's Magazine for 1736; the patient lived in the Strand; another, in the same periodical, 1739, at Wells, Somersetshire; one occurred in Upper Saxony; one near Prague in Bohemia, (Garthshore, Philosoph. Trans., 1787.) Chambon relates a case of five, which lived long enough to be baptized, (Campbell's Mid., p. 291.)

In the British and Foreign Med. Review for 1839, a notice is given of a woman at Naples being delivered of five children at seven months; in the Dublin Med. Journal for January 1840, there is an account given of Dr. Evory Kennedy having shown to the Dublin Pathological Society five ova of between two and three months, which were expelled at once under the superintendence of Dr. Thwaites. They were all male children. And if we could credit newspaper reports, we might add the following:—The wife of a cannon-founder at Luginski in

John Clarke's lectures, and some other works on the science, it is stated that Dr. Osborn met with six distinct ova thrown off at one abortion, but on what authority I have not been able to discover.*

When there is more than one fœtus in utero, each is generally smaller than in single births; and in proportion to the number will the size of the children be less. Thus Dr. Joseph Clarke's estimate of the weight of twins is twelve pounds and a half the pair. We often remark also that in twin gestations one fœtus at birth is sensibly smaller than the other. Should the uterus contain more children than two, the woman seldom carries them to the full term, and they are consequently rarely reared. On the subject of Plurality, a curious and learned paper by Garthshore, *Philosophical Trans.* vol. lxxvii. p. 344, June, 1787, may be consulted.

Twins may possibly proceed both from one ovarium, or the rudiments of one fœtus may be furnished by each gland. When the conception, however, is more than duplex, it is clear that one ovary must supply two; for no instance has yet been met with, where these organs were in excess. It is commonly supposed that twins are the result of one connexion; and instances are noted where this must have been the case. But it is not equally plain that this is a universal rule; and it appears to me by no means impossible that a second impregnation may take place soon after a former one has occurred. It is not difficult, indeed, to imagine that such an event may happen at any time previously to the uterus becoming lined with the secretion afterwards converted into the deciduous membrane, or until its mouth is plugged with that viscid mucus which divides its cavity from that of the vagina, and which, after its formation, would entirely prevent the immission of the seminal fluid *in coitu*.†

Russia was delivered, on May 22nd, 1836, of five girls, of whom four were living and likely to do well. (Satirist, Aug. 7, 1836.) The Giornale del Due Sicilie states, that a woman was safely delivered, on June 21, 1838, of a boy and four girls; all of whom died at the expiration of half an hour. (Times, July 23, 1838.) The wife of a landed propietor at Altruitweida, near Mitweida, in Saxony, was recently delivered of five daughters, who, though perfect in their conformation, died in about half an hour after their birth. (Times, Aug. 29, 1838.) So that Dr. Hull's case is by no means without a parallel.

* My father, who was a pupil of Dr. Osborn's for some time, and on terms of friendship with him, has no recollection of ever having heard him mention such a circumstance. Paré, (lib. xxv. chap. 3,) tells us, that in his day the wife of the Lord of Maldemeure, in the parish of Sceaux, near Chambellay, produced six children at a birth, after which she died; and that the then present Lord of Maldemeure was the only surviving one. His history of this extraordinary occurrence is so circumstantial, as to impress us with the belief that he was himself fully convinced of the fact. It would be going too far, perhaps, to say that such an event was impossible: but we must take into account that Paré, though an honest man, and excellent surgeon for his time, was a very credulous philosopher.

† Cases are recorded that bear upon this point. The celebrated one related by Buffon, for

Each individual child which the uterus contains, according to the law of nature, is distinctly enveloped in its own membranes,—so that its body is not in contact with that of its brother,—possesses its own quantity of liquor amnii, has a separate funis and separate placenta,—the circulations not inosculating. Generally the placentæ are attached together at a part of their edges; Plate XVIII. fig. 63; and often, on regarding the maternal face, they appear but one mass; at other times they are situated distantly from each other, at different points of the uterus; again, occasionally, though very rarely, the vessels of the one child anastomose with those of the other. It has been remarked, that both children have lain in one bag of membranes; and cases are recorded, where the placenta was in all respects single, and the funis also arose singly, and divided into two branches when about to terminate in the umbilicus of each fœtus.

Symptoms of twin gestation.—There are no symptoms during pregnancy which positively indicate to us that the womb contains more than one fœtus. Some have been noted and dwelt upon as diagnostic marks, but they are all more or less fallacious. Such are, the uterus being of a larger size than usual; but this may depend on an increased quantity of liquor amnii;—the woman feeling two distinct movements at different parts of the uterus; but the sensations of a pregnant patient on this point,

example, (Nat. Hist. vol. ii. p. 433, trans.) A white woman at Charlestown, South Carolina, was delivered, in 1714, of two children, one black, and the other white;—this difference in colour led to an inquiry, and she confessed that, on a particular day, immediately after her husband had left his bed, a negro entered her room, and threatening to murder her if she did not consent, forced her to submit to his will. Dr. Mosely has recorded another instance somewhat similar; (Tropical Diseases, p. 111;) it occurred within his own knowledge, on Shortwood Estate, Jamaica. A negro woman brought forth at a birth two children of the same size, one of which was a negro, and the other a mulatto. On being questioned, she admitted that a white man belonging to the estate came into her hut one morning before she was up, and she suffered his embraces, almost immediately after her black husband had left her. Dr. Dewees (Philadelphia Med. Museum, vol. i.) has related that a servant in Montgomery county was delivered of a black and white child at one birth, which were often seen by the doctor. He states also, that on the report of her pregnancy, both a black and white man disappeared from the neighbourhood; and Elliotson (Notes to Blumenbach, p. 485) has put on record, that Mr. Blackaller of Weybridge sent him the following account:—A white woman of very loose character left her husband, and some time afterwards returned pregnant to the parish, and was delivered in the workhouse of twins; "one of which," says Mr. Blackaller, "was born of a darker colour than I have usually observed the infants of the negroes in the West Indies to be; the hair quite black, with the woolly appearance usual to them, with flat nose and thick lips; the other had all the appearances common to white children." That these respective twins were not the offspring of one parent is very evident; and a second impregnation, therefore must have taken place; but we have proof in two, at least, that the connexions followed each other quickly, before any changes could have been commenced in the uterus. With the knowledge, then, of such accidental occurrences in our possession, we are warranted in believing that, in the case of a woman living with her husband, twins might possibly be the result of two separate connexions, if only a short period intervened between them.

Fig. 142.



Sinclair's Lith.

as expressed by her, are scarcely ever to be relied upon;—an irregularity in the shape of the womb; its being broader than common, or measuring more laterally than in the longitudinal direction; but this again may be the consequence of a transverse position of the fœtus, or an irregularity in the development of the uterine fibres themselves. If, indeed, it should happen that the organ was divided into nearly equal portions, by a sulcus running longitudinally downwards from the fundus to the cervix, we might suspect a twin gestation with some confidence. Collins,* Kennedy,† Montgomery,‡ and other practitioners who have given their attention to auscultation, as a means of distinguishing pregnancy, inform us, that they have detected twins in utero by the double pulsation of the fœtal hearts. This means of diagnosis can only be available to those who have acquired considerable tact in the use of this instrument; and, fortunately, such knowledge is not required for the purpose of regulating our practice; for although we might be assured of the gestation being plural before labour commenced, our treatment would not be in the least influenced by our discovery.

Position in utero.—The two children may each be placed in utero in all the varieties of position which one may occupy. It is generally believed that the most frequent presentation is the head of one and breech of the other, as depicted in Plate LII. fig. 142; but from my own tables (p. 445) I should conclude it was more usual for both the heads to offer themselves downwards. Campbell§ also states, that from a register of his cases, "he finds both the fœtuses have almost always presented the vertex."

Progress of labour and treatment.—Twin labour generally proceeds exactly in the same manner as though there was but one child. The pains increase in frequency and strength, the membranes protrude through the os uteri, and in process of time burst; but the uterine contractions are often more feeble than when the womb contains but one; and they do not seem so effective, since the upper ovum being interposed between the contracting fibres of the fundus, and the fœtus which is presenting, the organ must necessarily expend fruitlessly no small portion of its power. No interference, however, is necessary, solely on that account; and, provided nothing untoward happens, the labour must be allowed to proceed uninterruptedly, until the first child is expelled; when, for the first time,—although we might have had our suspicions before,—we become positively certain of the existence of a second.

I have already advised, that in all cases the hand of the attendant should be placed on the abdomen as soon as the funis is divided, to ascertain the

* Pract. Treatise, p. 310. † On Pregnancy and Auscultation, p. 129.
‡ On the Signs and Symptoms of Pregnancy, p. 126. § System of Midwifery, p. 293.

state of the uterus and placenta, and to learn whether there be a second child; if so, the womb will be found still large,—its fundus rising to the umbilicus, or above it,—and occupying a space apparently almost as great as before the birth of the first. We may detect, also, that degree of elasticity and subdued fluctuation,—if the membranes be still whole,—which are so characteristic of the uterus at full time. This simple examination will generally be sufficient to inform us of the fact; should any doubt, however, remain, the finger must be passed up to the os uteri, and the membranes of the second fœtus will be felt protruding, as during the first stage of natural labour.

It is possible, however, that we may be deceived both in the external and internal examination. The uterus may contain, besides the placenta, a large quantity of coagula, which may so distend its cavity, that the organ may occupy the principal part of the abdomen; but it will be softer than when another child remains; and on pressure being applied, blood will most likely be squeezed through the vagina. Again, a collection of blood behind the membranes of the retained placenta may be mistaken for the unbroken cyst of a second child. The case will be rendered clear on lacerating them; for coagula and fluid blood will escape instead of liquor amnii.

As soon as we have satisfied ourselves that the case is plural, it is our duty to determine the presentation of the second child as speedily as possible; and if it be transverse, to turn, as in ordinary cases, according to the rules already sufficiently detailed. But if the head or breech be presenting, the membranes may be ruptured immediately, that an opportunity may be given for the depending part to pass at once into the pelvis. There cannot be the same necessity for preserving the bag of membranes of a second fœtus entire that exists in single births, because the passages have been sufficiently prepared by the exit of the first to allow the easy transit of the second, if the children are nearly of the same size; and this proceeding frequently excites the uterus to increased energy, and facilitates the termination of the case.

It will occasionally happen, indeed, that the two children are expelled so rapidly, one after the other, as scarcely to give time for an internal examination to be instituted between their births; and it has occurred to me more than once to find a second child in the world before the one already born could be separated.

If the uterine contractions be tolerably powerful, the birth of a second twin is very seldom protracted, unless it be misplaced in utero, monstrous in formation, or much larger in size than the one first expelled. It is not unlikely, however, that twins may exist with a deformed pelvis, and both may require to be extracted, either by the forceps or craniotomy instru-

ments.* Women, then, seldom suffer much during the birth of a second twin. As the principal pains, under ordinary labour, are those of dilitation, and the sufferings generally in proportion to the resistance experienced, we should naturally expect that the second child would be born without either any great effort or much additional painful sensation. But when a woman, after having given birth to one child, learns that there is another still in utero, she mostly becomes not only apprehensive for her safety, but also fearful that she has to undergo a repetition of the agonies she has just endured; and such an impression on her mind may possibly interfere with the due continuance of uterine action. For this reason it is better neither to inform her abruptly of the nature of the case, nor to make any mystery about it; but calmly to tell her that she will soon give birth to a second; and this may be coupled with a congratulation on the fortunate progress of the labour so far; and an assurance that she will have but little more pain to bear, and that the case presents no features calling for anxiety.

In the conduct of a common twin case, it is of the greatest consequence that no attempt should be made to remove the placenta of the first until after the birth of the second, and that we should not make any traction at the cut funis which is hanging out of the vagina; for if we separate the placenta from its uterine attachment, flooding will almost certainly supervene, and the loss of blood may be so great as to require the immediate evacuation of the uterus; the only likely means by which it can be restrained.

Upon the expulsion of the second child, the uterus must be again examined, both externally and per vaginam, to ascertain that there is not a third, the birth of which (should there be another) is to be conducted exactly on the same principles; so likewise with regard to a fourth and fifth; for any practitioner may possibly meet with one of these prodigious instances of fecundity.

In every case of plural gestation, there is considerably greater danger —particularly from hæmorrhage—than when the birth is single; and this arises partly from the increased size which the uterus has acquired, and its indisposition to contract thoroughly; partly from the larger number of vascular orifices exposed on the separation of the placentæ; and partly from the greater chance of adhesion having taken place at some part of the more extended surface in apposition to the uterus. Our principal attention should therefore be directed to preventing or subduing flooding.

* Denman (chap. xvii. sect. 3) remarks, "If we were compelled to make the first labour artificial, it might be necessary or expedient to deliver the patient of her second on the same principle, unless the natural efforts should be efficaciously made soon after the birth of her first child." This as a general principle of action will perhaps be found the most frequently applicable; but there must exist numerous exceptions.

With this view the uterus, should be stimulated to throw off the placentæ by the grasping pressure of the hand, and the utmost care must be taken that both these masses pass from the cavity at, or nearly at the same time.* Compression on the uterine tumour, then, must be used more diligently than in common labours; and on examining internally, to ascertain whether the placentæ be separated and lying loose in the vagina, one of the funes must be twisted round two or three fingers of the left hand, and brought to its bearing, while the index of the right is carried to the brim of the pelvis; and afterwards the other must be treated in the same way. No attempt must, on any account, be made to extract them through the agency of the cords, until the beds of both can be most distinctly felt, and the principal part of their bulk surrounded by the finger, introduced as in a common examination; but when they have descended sufficiently low to be entirely encompassed,—each funis having been put slightly on the stretch,—traction may be made by both together, and the organs removed from the vagina, with the cautions before sufficiently, I trust, insisted on. Should flooding supervene after the birth of both children, or the time previously specified elapse, the hand must be introduced, and the placentæ withdrawn; should adhesion exist, the separation must be conducted on the common principles—care being taken not to remove either until both are fully in our grasp. The uterus must be stimulated to continued contraction by pressure, the application of cold and astringents if necessary; and the case must be treated as one of ordinary hæmorrhage. On the withdrawal of the placentæ, it is always desirable that the maternal face should be inspected, to assure ourselves that no part remains within the womb.

I need scarcely warn my reader that if flooding, convulsions, or other dangerous symptoms, show themselves between the birth of the two children, the ordinary methods must be used to combat them, and the delivery of the second must be undertaken as speedily as is consistent with safety. But there is a point admitting of some dispute, and deserving of very grave consideration—namely, the length of time that it would be desirable to wait after the birth of the first child, before means are taken to extract the second; no dangerous symptoms appearing in the interval. Some practitioners decry artificial assistance, merely in consequence of lapse of time, and found their arguments on the very excellent obstetrical maxim that Nature should never be interfered with, or thwarted in her intentions, so long as she can be safely trusted. The consequence of this doctrine is, that often many hours, sometimes many days, have been allowed to pass,

* Sometimes one of the placentæ will pass away while the second child remains in utero, without any serious hæmorrhage being produced, and Collins (p. 312) mentions four cases of this kind that happened under his own eye. But this is unusual, and the practice recommended in the text is that inculcated by all modern authors.

after the birth of one child, before the labour was terminated. This is a practice that I cannot sanction, because of the danger to which the woman must be more or less subjected during the interval; and because of the anxiety, excitement, and alarm, that must necessarily harass her mind until she is relieved: nor is it by any means improbable that such depressing feelings may materially interfere with her ultimate recovery. I therefore perfectly concur with Denman in thinking, that if uterine action is not re-established, some limit should be placed to our passive treatment, and that the time which "it may be expedient to wait shall neither be so short as to run the risk of injuring the patient by hurry or rashness, nor so long as to increase the danger, should any exist, nor the difficulty of delivering the patient, if we should be at length obliged to use art for this purpose." And I think the period specified by the same estimable physician—four hours perhaps—the least objectionable.* I have already advised that the membranes should be ruptured soon after the birth of the first child, and the possibility of being compelled to deliver artificially does not militate against this practice; for if the uterus acts vigorously, the fœtus will most likely pass naturally; and if the pains are feeble, or altogether deficient, there can exist little or no impediment to the introduction of the hand and the performance of turning: and this is the operation, indeed, which we shall find most usually called for, when it becomes necessary to terminate the labour by art. When the birth of the second child is retarded by inertia, a dose or two of the ergot may sometimes be prescribed, in the hope that its influence over the uterus will occasion such efficient action as to render any manual interference unnecessary; but if the specified time have elapsed, and our expectations be disappointed, we should not delay resorting to more certain means of finishing the delivery. These recommendations, however, must only be understood to apply to twin labours, at the full period of gestation. If one fœtus be thrown off prematurely, and another be retained in the womb, it would be unwise to rupture the membranes or extract manually—unless, indeed, the immediate preservation of the mother required the emptying of the cavity;—because it is not improbable that gestation might be carried on for the perfection of the one remaining, and it would be our duty to save it, even at the sacrifice of inflicting much personal inconvenience on the mother, or at some small risk to her.

Cases have been known, indeed, where one fœtus and placenta have both been expelled prematurely, and the other retained and carried until the completion of the period of gestation; and this without the patient suffering any dangerous loss of blood.

It is seldom that the membranes of both ova break before the first child

* Chap. xvii. sect. 3. Collins, p. 311, thinks it not wise to wait beyond two hours.

is expelled, but such cases are occasionally met with, and instances are recorded in which parts of two separate children descended into the pelvis together. Thus Dr. Ferguson of Dublin relates (*Med. and Phys. Journal*, 1832, vol. lxvii. p. 78) a case in which the head of one child and the feet of another presented at the same time. The midwife in attendance, before he arrived, had pulled down the feet, and jammed the breech and head together. The pains being very powerful the labour was terminated naturally; the child whose head presented being expelled first, the other afterwards. A case very similar is related by Mr. James Alexander, Jun., (*Edinburgh Med. and Surg. Journ.*, Jan. 1822.) Mr. Allan (*Med. Chirurg. Transactions*, vol. xii. p. 366,) gives us another, in which the heads of two children occupied the pelvis together, (the body of one being in the world,) and both were expelled simultaneously by uterine contraction. He refers to another also of the same kind in the *Journal de Med.* for Nov. 1771. I was on one occasion sent for to the assistance of a midwife who had been pulling at two feet, which I found external to the vulva. Although they were a right and left, I immediately detected, by the direction of the toes, that they belonged to different bodies; by gently pushing up one, and careful traction at the other leg, I extricated each breech from the brim of the pelvis, and both children were born living.

CONCLUSION.

I have in the foregoing pages endeavoured to introduce the student to an acquaintance with the principles and practice of obstetric medicine, in so far as relates to the process of parturition. My chief object has been to lay down well-established principles for his guidance in most cases of difficulty and anxiety, deduced either from my own experience, or from the recommendation of authors of acknowledged credit and authority. I am fully aware of the imperfections and omissions with which the work abounds; but as I do not profess to offer it to my professional brethren as a finished treatise, and as my intention has been to address those just entering on this arduous and diversified practice, I trust my attempt will meet with the indulgence generally extended to all who strive to elucidate an abstruse and comprehensive subject. It may be considered, perhaps, that plural births, especially, have not been treated of as largely as their importance deserves; but, in truth, the management of such labours does not differ essentially from our duties in the more ordinary cases; and I have therefore thought it better to be concise, than to fatigue the reader with unnecessary minuteness and tedious repetition.

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