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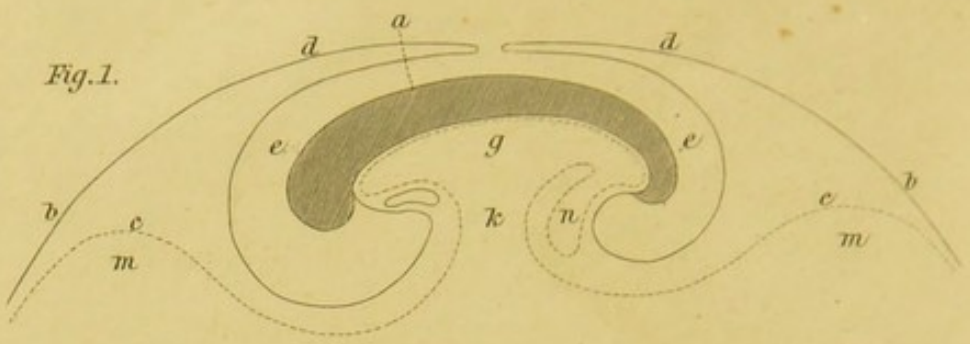

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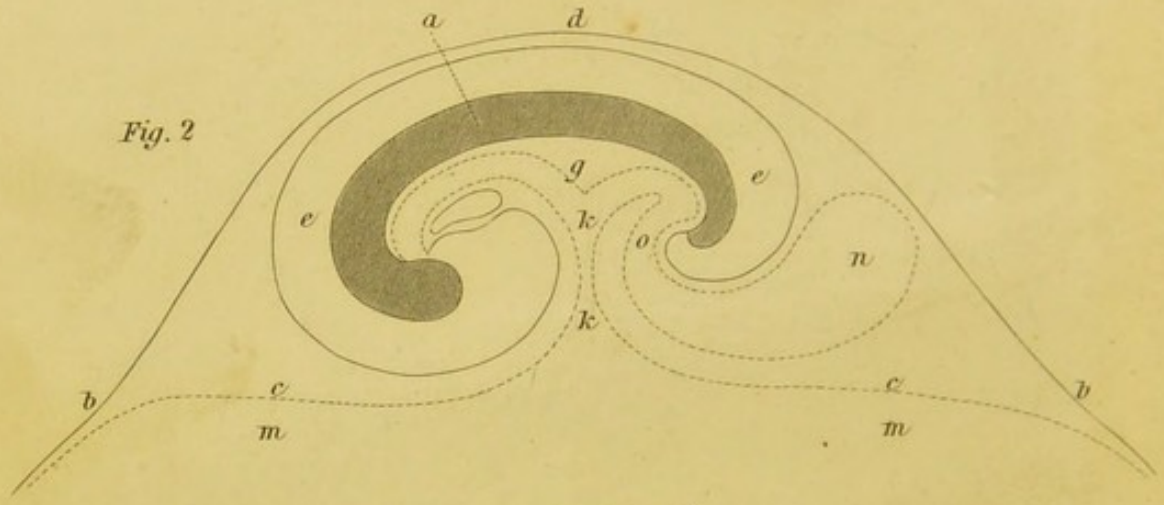

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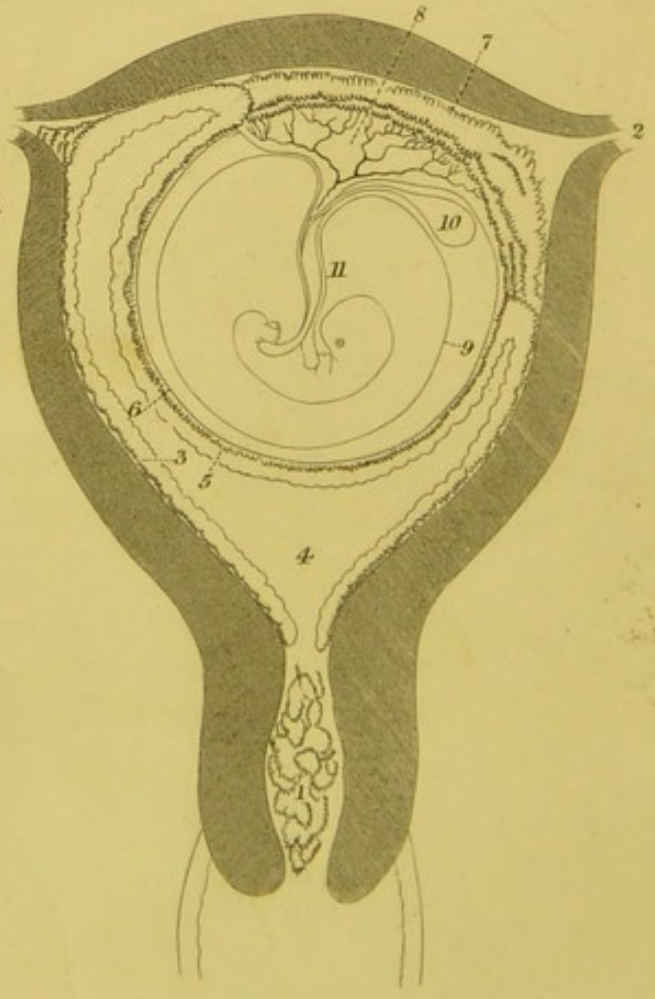


J. Gellatly, Sculp.t Edin.r

INTRODUCTION

TO

THE STUDY AND PRACTICE

OF

MIDWIFERY.

BY

WILLIAM CAMPBELL,

LATE SURGEON, R.N.,

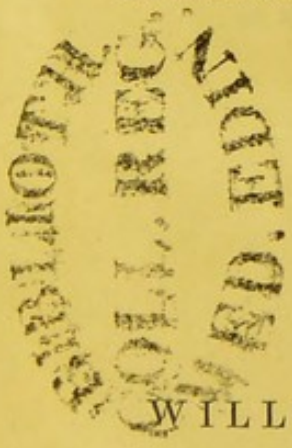
GRADUATE OF THE UNIVERSITY, FELLOW OF THE ROYAL COLLEGE OF SURGEONS, PHYSICIAN ACCOUCHEUR TO THE ROYAL DISPENSARY, AND LECTURER ON MIDWIFERY, ETC., EDINBURGH; FELLOW OF THE ROYAL MEDICO-CHIRURGICAL SOCIETY OF LONDON, HONORARY MEMBER OF THE OBSTETRIC SOCIETY OF MANCHESTER, CORRESPONDING MEMBER OF THE ROYAL NATURAL HISTORY AND MEDICAL SOCIETIES OF HEIDELBERG, OF THE ROYAL MINERALOGICAL SOCIETY OF WEIMAR, AND OF THE IMPERIAL SOCIETY OF PHYSICIANS OF VIENNA; AUTHOR OF A WORK ON PUERPERAL FEVER; OF PRACTICAL INSTRUCTIONS TO FEMALE PRACTITIONERS; AND OF A MEMOIR ON EXTRA-UTERINE GESTATION, ETC., ETC., ETC.

AND BY

ALEXANDER D. CAMPBELL, B.A.,

TRINITY COLLEGE, DUBLIN,

BACHELOR OF MEDICINE, ST JOHN'S COLLEGE, OXFORD, FELLOW OF THE ROYAL COLLEGE OF SURGEONS, LECTURER ON FORENSIC MEDICINE, AND PHYSICIAN ACCOUCHEUR TO THE ROYAL DISPENSARY, ETC., EDINBURGH.



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MDCCCXLIII.

TO

FRANCIS CHARLES NÆGELE, M.D.,

PRIVY COUNSELLOR TO THE GRAND DUKE OF BADEN;
KNIGHT COMMANDER OF THE ORDER OF ZAHRINGIAN LION AND OF THE ROYAL DANISH
ORDER OF DANNELROCH; PROFESSOR OF MIDWIFERY AT HEIDELBERG;
MEMBER OF THE IMPERIAL ACADEMY OF MOSCOW, AND OF THE ROYAL SOCIETIES OF WILNA,
BERLIN, BONN, BRUSSELS, HEIDELBERG, LEIPSIC, LONDON, PHILADELPHIA,
VIENNA, LYONS, MARSEILLES, MADRID,
ETC. ETC. ETC.

WHOSE UNREMITTING ZEAL FOR THE

IMPROVEMENT OF THE SCIENCE AND PRACTICE OF MIDWIFERY,

HAVE RAISED HIM TO THE FIRST RANK OF

OBSTETRIC EMINENCE IN HIS OWN COUNTRY, AND GAINED HIM THE

UNIVERSAL ESTEEM OF HIS BRETHREN ABROAD,

This Work

IS DEDICATED BY HIS OBEDIENT SERVANTS,

THE AUTHORS.

THE AUTHORS

BEG ALSO TO DEDICATE THIS WORK AS A MARK OF FRIENDSHIP,

TO THOSE GENTLEMEN

WHO HAVE BEEN HEARERS OF, OR ARE NOW ATTENDING

THEIR LECTURES.

PREFACE

TO THE SECOND EDITION.

The reception experienced by the former Edition of this Work has encouraged the Authors to continue in the present, the arrangement which was originally adopted. It will, therefore, be found to embrace an ample consideration of the Anatomy and Physiology of the Female Genitals in the unimpregnated and gravid states; of the Medico-legal questions connected with them; of the Operative Departments of Midwifery; and of the Pathology and Treatment of the Diseases incident to Women and Children. The utility of entering so fully on Anatomy, Physiology, and Juridical Medicine has been doubted; but with due deference to the opinions of competent judges, it will be admitted that the experience of those practitioners, on whose attention the consideration of the branches referred to are so frequently and urgently forced, must be fully as deserving of confidence as information derived from a second source.

In preparing this Work for publication, the Authors have been chiefly desirous of advancing its contents, in every Department, to the present standard of information. The whole, therefore, has been carefully revised, several new subjects have been introduced, while more than eighty pages of letter-press have been added.

Except on contested and doubtful questions, quotations and references to authorities have been avoided as much as possible; since an opposite plan, by increasing the size of the Work, would have

rendered it more expensive, without benefiting either the student or the practitioner, who, when in possession of a publication containing an ample digest of every subject which it ought to embrace, do not require, and seldom have sufficient time at command, to consult authorities. In making this statement, however, it will be found that the Authors have availed themselves of all useful information from every standard Work. Where no mention is made of the names of writers, or of publications, the omission, it is hoped, will be considered, not as arising from disrespect, but from the Works being either inaccessible, or embodying doctrines which have long been recognized by the Profession as established.

The Authors may probably be censured for not having added numerous explanatory plates; but after the most mature consideration they doubt the expediency of these embellishments. Although diagrams of structure, and of the steps to be pursued in surgical operations, may be very necessary to refresh the memory of a surgeon who is, perhaps, but rarely called upon to operate, and not in a situation to renew, from time to time, his knowledge of Anatomy; yet the Obstetric practitioner is in a widely different position, since, after his attendance on courses of lectures, properly illustrated by Preparations and Machinery, and after he has devoted, with sufficient industry, a suitable period to the acquisition of Clinical experience, his duties become so familiar to him, either from their being very simple, or from his being frequently called upon to perform them, that he rarely, if ever, thinks it necessary to consult plates or diagrams.

EDINBURGH, 4 PICARDY PLACE,
November 1843.

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AN

INTRODUCTION

TO THE

STUDY & PRACTICE OF MIDWIFERY.

PART FIRST.

THE ANATOMY AND PHYSIOLOGY OF THE ORGANS CONCERNED IN MIDWIFERY; AND THE CONSIDERATION OF SUCH POINTS OF LEGAL MEDICINE AS ARE CONNECTED WITH IT.

To understand the functions of organs, an intimate knowledge of their structure is necessary. As a preliminary step towards the study and practice of midwifery, I shall describe the anatomy, and point out the importance of those parts more immediately concerned in conception and parturition. They may be divided into hard and soft: to the former belongs the pelvis; to the latter, the parts which cover it, and the sexual organs contained in its cavity.

The structure of the pelvis is so simple, and the procreative organs so distinctly displayed, that a correct knowledge of the whole may be easily acquired. When we consider the connections and formation of the pelvis; its situation and position with reference to the rest of the skeleton; the organs to which it affords protection; and its influence on the safety of the mother and fœtus during parturition; the necessity of being well-conversant with this department of anatomy will appear obvious. The liability of the pelvis, and soft parts connected with it, to be the seat of injuries and diseases incident to other regions of the body, should render the anatomical department of midwifery no less an object of attention to the physician and surgeon, than to the obstetric practitioner. In medico-legal questions connected with midwifery, the decisions of the practitioner are chiefly founded on an intimate acquaintance with the structure and functions of various organs in the parent and child.

CHAPTER I.

PELVIS.

This is the term applied to that cylindrical bony cavity subjoined to the spine, and resting upon the femora with which it is articulated. It has been so styled, from its supposed resemblance to a basin; but it deserves this name, more on account of its particular use in containing several organs, than from its formation. In the adult, four bones compose the pelvis, viz. the *os sacrum*, *os coccygis*, and the two *ossa innominata*. These pieces in the fœtal pelvis, and in that of persons little past the age of puberty, are subdivided into several more portions; but as the individual approaches to maturity, they become consolidated and diminished in number. The divisions of the sacrum are termed false vertebræ; each of those of the ossa innominata has also a distinct name which is still retained, although no traces of their original line of demarcation can be distinguished. The bones which compose the pelvis are so carefully united by means of cartilage, ligaments, and muscles to be hereafter described, that in the recent subject they are nearly immoveable.

Sect. I.—*Os Sacrum.*

This bone, so called because it was offered in sacrifice by the ancients, represents a kind of inverted pyramid, flattened and a little incurvated, and forms the upper and back part of the pelvis. Its dorsal surface is convex and irregular, exhibits numerous projecting points, that give attachment to ligaments which pass between it and the other bones, and to muscles of the spine and thigh. The inner surface of the sacrum is concave, smooth, and polished.

This concavity describes a curve nearly half an inch in depth, called the hollow of the bone, by which the capacity of the pelvis is considerably enlarged. On the centre of the dorsal aspect of the sacrum, taking a longitudinal course to the fourth portion of the bone, is an irregular ridge which corresponds with the spinous processes of the vertebræ. Immediately under, and pursuing a similar direction with this ridge, is a passage in the substance of the bone, denominated its *canal*, which terminates at the same point with the ridge. This canal receives the most depending portion of the medulla spinalis, and sends off at its extremity

two small forked processes which serve to connect the sacrum with the coccyx. As the posterior part of the sacral canal is incomplete from the fourth portion of this bone, and the cauda equina consequently more exposed to injury, a strong ligamentous expansion, with muscular fibres, are reflected over this point. Notwithstanding the protection thus afforded to the cauda equina, falls or blows upon this point are attended with such excruciating pain, as sometimes to occasion syncope, and to be followed by temporary paralysis of the sphincters of the rectum and bladder. On each side of, and communicating with, the sacral canal, are four perforations, which, in the recent subject, are almost closed with cellular membrane, leaving only a sufficient opening for the transit of small nerves sent off from the spinal cord to the neighbouring parts.

Upon the concave surface of the bone are also seen the same number of apertures as on the external side; and they likewise communicate with its canal; but they are larger than those already noticed. Large branches of nerves given out by the medulla spinalis pass through these perforations, and some of them are distributed to the genital and urinary organs, while the rest proceed through the pelvis to constitute the nervous trunks of the lower extremities. Instead of four, we sometimes observe five pair of foramina, in consequence of the sacrum being composed of six portions, or the shoulders of the first portion of the coccyx being united to the transverse processes of the fifth part of the sacrum. Through these apertures, when present, the twenty-ninth pair of spinal nerves pass.

In the adult well-formed pelvis, the sacrum measures four inches and a half in length, including the curve; without it, only four inches; its greatest breadth is four inches; while its thickness taken at the centre, is two inches and a half.

The sacrum, in young subjects, is composed of five, sometimes six pieces, which are joined by an intermediate thick layer of cartilage, similar to that betwixt the true vertebræ. In this cartilaginous structure bony matter is deposited, but its situation is pointed out to a very advanced period of life, by transverse ridges and lines on the concave surface of the bone. The portions which form the sacrum are termed *false vertebræ*, as they do not contribute to the motion of the trunk, like the pieces which enter into the formation of the other divisions of the spine.

The structure of the sacrum is analogous to that of the true vertebrae; but it is more spongy and lighter than any other bone of equal size in the skeleton. Where it is con-

nected to the lumbar spine, a joint is formed possessed of considerable motion; laterally, it is joined to the ossa innominata by an immoveable synchondrosis, or what almost deserves the name of a suture, termed sacro-iliac symphyses, or sacro-iliac syncchondroses; below, it is articulated to the os coccygis in such a manner as to admit of free motion. The sacrum contributes largely to the formation of the pelvis; and it serves as the common base and support of the trunk. It is liable to the same diseases as the true vertebrae, such as rachitis, mollities ossium, and caries. It is rarely fractured, and the degree of violence which produces such an accident, is almost always fatal.

Sect. II.—*Os Coccygis.*

This is the pyramidal chain of small bones which is appended to the sacrum, and is so styled from its resemblance to the beak of a cuckoo. It is concave and smooth anteriorly; convex and irregular posteriorly. In infancy it is cartilaginous, but gradually becomes ossified after the individual has arrived at maturity, when it can be separated into four distinct portions. These pieces are united by intermediate cartilage, which enables them to move on each other. At the union of the coccyx with the sacrum, the mobility is so great that the former bone admits of being pushed backwards a full inch during parturition; or the coccyx feels loose as if it were floating among the muscles: the motion, however, is greater between the first and second portion, than betwixt the bone itself and the sacrum. Its upper portion is a little broader than the extremity of the sacrum; it has projecting shoulders, which send up two processes to be united to those pointing downwards from the sacral canal. These pieces gradually diminish in breadth and thickness, from the top of the first to the extremity of the last, which terminates in a rough point; and here the two inferior pieces are so intimately connected, especially in old age, as not to be easily distinguished from one another, which amalgamation may, in some instances, have given rise to the idea that the coccyx was composed of three portions only. The extremity of this bone is considerably incurvated, which renders it less liable to injury, and assists it in giving greater support to the pelvic viscera.

In the adult, ossific matter is deposited in the cartilage by which the sacrum and coccyx are united, and the portions of the latter with each other; the whole are anchylosed, and

motion abolished. This change happens much sooner in females who have never had children, or such as are well advanced in years previous to their becoming mothers, than in women who have become matrons at an early period of life. Motion, however, continues longer between the first and second portion of the coccyx, than betwixt this bone and the sacrum. When ossific matter is deposited in the intermediate cartilages, the original divisions of the coccyx are marked by transverse indentations on its internal surface, and by a small notch on both its margins, at the extremities of each line.

As the mobility which exists between the sacrum and coccyx increases the long diameter of the outlet by an inch, their anchylosis must diminish it in the same ratio, and, during parturition, aggravate the sufferings of the individual. In the autumn of 1818, the author witnessed the application of the crotchet from anchylosis of the sacro-coccygeal symphysis, in a female twenty-seven years of age, who had been nearly forty hours in labour of her first child. Although the result of such cases may, in some instances, be destructive to the fœtus, yet, it should be known, that in far the majority of examples, where the parturient agents act with power, this kind of obstruction will be overcome in due time, by the forcible pressure of the head against the coccyx, which must ultimately be fractured or separated from the sacrum. Cases are recorded where these accidents actually occurred during parturition, and the fracture or separation was accompanied with an unusual sound. Fracture of the coccyx, or its luxation, may also be occasioned by falls or blows upon the nates; and when this is not discovered, and reposition not attempted, the case may terminate in troublesome suppuration, and the discharge of the displaced bone by the rectum. Dr Ramsbotham, jun., however, relates three cases in which the anchylosed joint gave way during parturition, not only without much suffering, but without any permanent injury.

This bone is supported in its situation by its connection with the sacrum, and by ligaments and muscles to be hereafter described. The necessity of such support will appear evident, when we consider the degree of pressure to which the coccyx is exposed from the fœtal head in the latter stages of parturition.

The coccyx contributes to the formation of the inferior opening of the pelvis, and to afford support to the uterus and rectum. In its structure and diseases, it resembles the sacrum.

Sect. III.—*Ossa Innominata.*

The nameless bones are so styled from their want of resemblance to any other known object; they form the upper, under, and lateral parts of the pelvis. When viewed exterternally, they present an irregular surface, with elevations and depressions, occasioned by the action of the gluteal, and other superincumbent muscles. These bones are thin, flat, and expanded above, but become thick and irregular below their centre. Internally, their surface is smooth and concave above; and from near the middle, downwards, it exhibits a sloping plain, and is still smooth.

In infancy, each of them consists of three pieces, which have distinct names; viz., ilium, ischium, and pubes. They are united by a layer of cartilage, in which ossific matter is gradually deposited, and their union in the adult so consolidated, that they form but one bone. Although the names applied to the different portions of the innominata in the infant pelvis, are still retained in that of the adult, yet in it no traces of their original line of demarcation can be observed, except occasionally in the acetabula. In these cavities, which are formed by their conjoint union, we can distinguish for a considerable period, the situation of the cementing cartilage.

The os innominatum in a female of the ordinary stature, is nearly six inches and a half in length, measured from the anterior superior spinous process of the ilium, to the tuberosity of the ischium; and an inch more, if the line be drawn from the middle of the crista ilii: its breadth from the anterior superior to the posterior superior spinous process, measures about six inches. Though the iliac portion of the innominatum is not concerned in parturition, yet a knowledge of the depth of the pelvis laterally, may be desirable in cases of deformity.

Sect. IV.—*Os Ilium.*

The haunch bone is the upper flat expanded portion of the innominatum, of which, in the adult pelvis, it constitutes fully one half. Its external irregular convex surface, is called *dorsum;* the internal smooth concave surface, *venter.* This concavity, which is shallow but extended, lodges the iliacus internus muscle, and affords protection to some of the smaller intestines, and to the gravid uterus in the latter stages of gestation.

Besides the parts described, there is the *crista*, upper mar-

gin, or spine; the *anterior* and *posterior margins*, and the *base*. The crista is the longest of the three margins, and has an external and internal lip with an interstice. This part gives attachment to the three lateral muscles of the abdomen, to some of those belonging to the back, and to the gluteus maximus and medius. It is covered with cartilage, which drops off by maceration. The anterior extremity of the spine terminates in a small projection, which constitutes the *anterior superior spinous process*, and gives origin to the Sartorius, and Tensor Vaginæ Femoris.

On the anterior margin, which is next in length to the crista, a little below the anterior superior spinous process, there is a notch, and immediately under this, the bone exhibits another protuberance, termed *anterior inferior spinous process*, from which the rectus femoris muscle originates. The notch above mentioned is partly occupied by the sartorius, and partly by the rectus. Below the process last described, and rather towards the concave aspect of the Ilium, is a depression which points out the course of the Iliacus Internus, and Psoas Magnus muscles, to their insertion; also the situation of the anterior crural vessels and nerves in their passage to the thigh.

On the base of the Ilium, which is the thick portion below the venter, a ridge called *linea innominata* is formed, which extends anteriorly towards the pubes, distinguishing the boundary of the upper opening, or what is termed *brim*. All above this ridge is known by the appellation, *large pelvis;* the cavity below it being called *small* or *true pelvis*. This ridge is obtuse at the sacrum, but becomes progressively more acute as it advances to the os pubis, where it is sometimes so sharp in the skeleton, as to be capable of injuring the fingers were they pressed against it. It is the iliac and pubic portions of this ridge that are styled *linea-ilio-pectinea*, into the posterior extremity of which, the tendon of the psoas parvus is inserted.

The posterior margin of the Ilium, which is the shortest, exhibits processes and depressions, somewhat similar to those on the anterior edge. The sacral extremity of the crista terminates in a point, to form the *posterior superior spinous process*. These processes, which are by no means so conspicuous as those on the anterior margin, give origin to several muscles; but they serve chiefly for the attachment of powerful ligaments that assist in concentrating the union between the bones of the pelvis at this point. On a line with the second pair of foramina in the hollow of the sacrum, the inferior posterior extremity of the margin forms a slight sharp

projection, which is the *inferior posterior spinous process.* Below the process last described, is a large deep depression, termed *iliac notch;* but in the recent subject it deserves to be called iliac foramen, into which it is converted by the particular position of the sacro-sciatic ligaments. This notch or foramen gives exit to the internal obturator and pyriform muscles; the gluteal, sciatic, and pudic arteries; and the great sacro-sciatic nerve.

At birth, a great portion of the ilium is cartilaginous; in old age, the venter becomes diaphanous from the action of the muscles expanded on its surfaces, where we also remark a number of small perforations for the transit of nutritious vessels into the bone. It is connected at its posterior margin to the sacrum, by that powerful articulation denominated sacra-iliac synchondrosis; and to the ischium and pubes, in the acetabulum, of which cavity it forms rather less than two-fifths. The ilium is chiefly concerned in the formation of what is called the great pelvis; and it also constitutes a part of the upper opening of the true pelvis. With regard to the diseases of this bone, they are the same with those mentioned in describing the sacrum; it is never fractured except by great violence.

Sect. V.—*Os Ischium.*

The seat bone is situated almost perpendicularly under the ilium. It is divided into body, spine, tuberosity, and ramus. The *body* is that thick irregular portion immediately under the acetabulum, of which cavity it forms rather more than two-fifths. Externally, it presents a rough unequal surface, and gives origin to a number of muscles pertaining to the lower extremity. Internally, it is smooth, presenting an inclined plane, which is directed obliquely to the pubes, and is thought to aid the vertex during parturition, in sliding downwards and forwards to the fore part of the pelvis.

Immediately below the great iliac notch, the spine of the ischium projects backwards, a little inwards, and obliquely downwards from the back part of the body of the bone. It serves for the connexion of the sacro-sciatic ligaments; and it is also by some, though very incorrectly, supposed to assist in advancing the vertex from the acetabulum into the arch of the pelvis during the descent of the head. Below the spinous process is a notch termed *sciatic*, and converted by the sacro-sciatic ligaments into a foramen for the exit of the tendon of the obturator internus muscle, and for the en-

trance of the common pudic artery, with its accompanying vein and nerve, into the pelvis.

The *tuberosity* of the ischium is that part of the pelvis on which we sit. In the recent subject it is covered with defensive cartilage, gives origin to a number of muscles, and contributes to the formation of the *outlet* of the pelvis; it has an external and an internal labium with an interstice.

Proceeding obliquely upwards from the tuber ischii is a long flattened process, which is the crus or ramus of the bone. It is thick and broad at its origin, but becomes a little thinner and narrower towards its termination; it is flat on its external and internal surfaces. The ramus contributes to the formation of the arch of the pubes and *foramen thyroideum;* and gives origin to several muscles of the lower extremity.

The ischium forms a large portion of the cavity of the pelvis, and is connected with the ilium and pubes in the acetabulum. A great part of this bone is cartilaginous at birth, especially where it enters into the formation of the acetabulum, the spinous process, tuber, and a portion of the ramus where it joins the pubes. In its structure and diseases, it resembles the other bones already described.

Sect. VI.—*Os Pubes.*

The share bone, situated in the anterior part of the pelvis, forms the smallest portion of the os innominatum. It is divided into body, angle, ramus, and crest: the *body* is that part which joins the ilium and ischium, at which point it is thick; but where it is united with its fellow of the opposite side, it is thin and flattened. Its upper surface is broad at the iliac, and narrow at the pubic extremity; the inner and outer surfaces, on the contrary, are broad at the pubic, but narrow at the acetabular termination. On the upper margin of the inner surface is the linea-ilio-pectinea; this surface also exhibits a plane which slopes from the acetabulum towards the anterior extremity of the pubes, and is supposed to aid the vertex in sliding during its descent from the posterior to the anterior part of the pelvis.

The *angle* of the pubes is that point of the bone which joins its fellow of the opposite side, forming between them a joint termed *symphysis pubis.* This joint, which is of peculiar formation, is about an inch, or an inch and one half in length.

At a little distance from the symphysis, projecting from the external surface of the bone, is a short obtuse process called *crest* of the pubes, into which the anterior extremity of

Poupart's ligament is inserted. From this process to the breach in the acetabulum, running obliquely, is a ridge which is placed immediately over the upper margin of the foramen ovale.

The next part of the pubes to be considered is its *ramus* or *crus*, a term applied to that thin flat portion of the bone which declines obliquely from the inferior extremity of the symphysis to join the ramus of the ischium. By the union of the rami or crura of the ossa pubes with those of the ischia is formed the *arch of the pubes*, the greater size of which in the female is a distinguishing feature of her pelvis.

On each side of the pubic arch is the *foramen thyroideum*, *obturatorium*, or *ovale*, formed by the union of the ramus of the pubes and ischium of each side. Except at a little distance from the acetabulum, where there is a groove, the whole of this large opening is closed in the recent subject by a ligamentous expansion, and hence the term *obturatorium*. This groove is formed for the exit of the obturator artery and nerve from, and the entrance of their corresponding vein into, the pelvis.

The pubes contributes to the formation of the brim and cavity of the pelvis, by which it affords protection to the abdominal and pelvic viscera. It is connected with its fellow of the opposite side, and with the ilium and ischium in the acetabulum, of which it forms about a fifth. In its structure and diseases, it resembles the other bones of the pelvis; at birth, a considerable portion of it is cartilaginous, particularly at its crus.

Sect. VII.—*Divisions of the Pelvis.*

The union of the different pelvic bones lead to the formation of regions that have received distinct names, which ought to be remembered, if it were merely to describe with precision the relations which the unimpregnated and gravid uterus in their various positions, and the cranium of the fœtus in its progressive descent, bear to this bony cavity. These divisions are, the great and small pelvis, the brim, cavity, and outlet. The *great pelvis* is formed, posteriorly, by the two inferior lumbar vertebrae; laterally, by the ilia; and anteriorly, by the pubic bones. The boundaries of the superior opening, or *brim*, are pointed out by the linea innominata and linea-ilio-pectinea, on both sides. Underneath these lines, extending to the plane of the tuberosity of the ischia, is the *small pelvis*. The arch of the pubes, tuberosities of the ischia, extremity of the coccyx, with ligaments, to

be hereafter described, constitute the inferior opening, or *outlet*, which, when divested of the soft parts, is much less regular than the brim.

Sect. VIII.—*Peculiarities of the Adult Female and Infant Pelvis.*

A comparison of the female with the male pelvis is the most satisfactory manner of acquiring a correct knowledge of the peculiarities of the former; and this object is also better attained by considering each pelvis as a whole, than by examining their bones individually. The marks by which the female pelvis is distinguished, are sufficiently characteristic, and very important in an obstetrical point of view. For while they explain how the sufferings of the sex in the parturient state are alleviated, they also enable us to draw a line of distinction between the proper formation and malformation of the pelvis. The advantages to be derived from a comparison of the adult female pelvis with that of the infant, are interesting only in so far as they teach us the influence which the development of the genital organs exerts upon the formation of the pelvis, at the age of puberty.

In comparing the adult female pelvis with that of the male, we observe that in the latter, the promontory of the sacrum projects more towards the symphysis pubis,—in the former less so. The ilia are more expanded in the female, and afford greater accommodation and protection to the intestinal viscera, and to the gravid uterus. Their fossæ are larger and turned more outwards, which increases the prominence of the hips; the crest of the ilium is less twisted; and the space betwixt the symphysis pubis and acetabulum is greater, accounting for the marked prominence of the trochanters, and the separation of the femora, which gives the female a peculiar gait in walking. The obturator foramen is triangular. At the brim, the male pelvis is round or triangular, and contracted, and its cavity deep; while in the female the brim is more capacious throughout, of an oval shape, and the basin shallow. The pelvic cavity being shallow in the female, and the extent of surface opposed to pressure consequently less, her sufferings during the transit of the head are mitigated. In confirmation of this remark, tall females, in whom the pelvis is generally deep, suffer more during labour, than women of moderate stature, in whom the pelvis is usually shallow. The symphysis pubis is deeper, and the pubic arch more contracted in the male than in the female: in the latter it is rounded, wider, and more

curved; the inner margins of the rami of the ischia are more prominent and more perpendicular. A capacious arch is a favourable circumstance for child-bearing. In the female, the concavity of the sacrum is greater than that in the male. The outlet in the male is very contracted; in the female its capacity is much greater; and it has this increased by the mobility of the coccyx, and the greater space betwixt the tuberosities of the ischia. In a word, the female pelvis is larger than the male in its horizontal dimensions, while the male pelvis exceeds that of the female in its vertical diameters. All these modifications being evidently intended by nature to facilitate the advance of the foetus through the pelvis, and diminish the sufferings attendant on parturition.

In the pelvis of a young female under the age of puberty, we observe that the shape of the brim is round or triangular; that its largest diameter is from sacrum to pubes, whilst its shortest extends from one os innominatum to the other. The diameters of the outlet are also reversed; for, its long occupies the space between one tuber ischium and the other; and its short, that from the extremity of the symphysis pubis to the point of the coccyx. The pelvis in the young of our race is so small, and its developement so progressive, while the ilia are not excavated, but straight and flat, that some of the viscera proper to it are forced into the abdominal cavity; and hence, partly, the tumidity of the abdomen in children. One of the most characteristic peculiarities of the pelvis in early life is its much greater inclination than in the adult. A horizontal line, extending from the top of the symphysis pubis, would fall nearly at the junction of the first with the second portion of the sacrum: a line drawn from the same point in an infant would fall about the centre of the third portion of the sacrum. These peculiarities of the young pelvis continue until the individual commences to exhibit the first demonstrations of having arrived at maturity, when the short begin to lengthen progressively at the expense of the long diameters, and all the other peculiarities of the adult pelvis are progressively developed.

Sect. IX.—*Uses of the Pelvis.*

First, It supports the upper parts of the body, and is well calculated to do so, from the resemblance of its formation to that structure which, in architecture, is styled the double arch, of which the sacrum forms the key-stone. To this idea my very distinguished friend Professor Naegelè objects, on the ground that the greatest breadth of the key-stone is

at its upper surface, while that of the sacrum is not the broadest part; but although the resemblance is not perfect, it is nevertheless subservient to the same ends. Moreover, the pelvis, forming with the vertebral column an inclination of from 60 to 70 degrees, enables the individual to maintain his equilibrium, of which he would be incapable, were the angle more acute. The sacrum, to use a mechanical phrase, is dove-tailed between the ossa innominata, and so firmly fixed by the construction of the sacro-iliac-synchondroses, that it can support, without the slightest risk of displacement, and under the most violent exertions, the heaviest loads with which an individual can be charged. The ossa innominata participate in the influence which the pressure of the upper parts of the body exert on the sacrum—these bones being forced against the femora, which in their turn react upon the sacrum; and hence it happens, that the greater the superincumbent pressure upon this last bone, the more firmly is it locked between the ossa innominata.

Secondly, The pelvis, from its position, affords, more especially in the pregnant state, considerable support to the uterus, which, in the later stages of gestation, rests upon the anterior part of the brim. Were the brim parallel to the horizon, the individual would be more subject to prolapsus uteri; and the gravid organ even would subside so much into its cavity, that it would be productive of distressing tenesmus, with frequent and painful micturition.

Thirdly, The pelvis affords attachment and protection to the external and internal genitals, and a centre for the origin and insertion of many important muscles of the trunk and inferior extremities.

Fourthly, The pelvis is the centre of all the great motions of the trunk; for when the body appears to be moving freely at the sacro-lumbar articulation, the motion must be considered as the result of the different vertebræ moving upon each other, or the pelvis rolling on the heads of the femora.

Fifthly, From the heads of the femora being received into, and articulated with, the acetabula, whereby the individual is transported from place to place, the pelvis may be considered as a principal agent in the function of locomotion.

CHAPTER II.

UNION OF THE BONES OF THE PELVIS WITH EACH OTHER, AND ARTICULATION WITH THE LUMBAR VERTEBRÆ AND OSSA FEMORA.

The bones which compose the basin form, by their union with each other, four joints. Of these, the symphysis pubis is placed anteriorly; two denominated sacro-iliac synchondroses or symphyses, posteriorly; and the sacro-coccygeal, inferiorly. Additional joints result from the connection of the pelvis with the lumbar vertebrae and ossa femora, which may be called the sacro-lumbar and the ilio-femoral.

Section I.—*Symphysis Pubis.*

It was formerly supposed that the pubic bones were united simply by an intermediate layer of cartilage, analogous to the union between the other portions of the pelvis. Subsequent investigations, however, have demonstrated that the construction of this joint is peculiar, and much stronger than could have been effected by cartilage alone.

At this point, the extremity of each bone is covered with its proper layer of smooth polished cartilage, rather of a semilunar shape, slightly convex on one bone, and concave on the other, to receive the convexity of the former; and between these laminæ something of a fibrous structure, which binds them together, is interposed. These fibres are disposed in a transverse direction; and if the pelvis of a female at the age of puberty, or very little older, be examined after this fibro-cartilaginous matter is separated by maceration, the points to which the fibres are affixed can be distinguished by numerous superficial perforations in each articulating surface. This description is generally applicable, but as properly observed by M. Tenon, the fibrous texture cannot be demonstrated in every instance, since examples are occasionally met with, where the bones of the pubes are united merely by an intermediate lamina of cartilage.

This fibro-ligamentous, or cartilaginous structure, is thicker in females than in males; and from what may be observed in those who have died in child-bed, it is obvious that this structure becomes thicker and softer during gestation. This joint is fortified by several other ligamentous productions; *first*, the anterior; *secondly*, the posterior; *thirdly*, the superior; and *fourthly*, the inferior pubic or triangular ligament. The two former are extremely thin; the latter is very strong.

A part of this forms the upper border of the arch of the pubes, surrounds the inferior extremity of the symphysis, and assists in binding the bones together.

This joint, in early life, may be considered as a species of symphysis or synchondrosis, as the bones are united by intermediate substance; but in old age, it is often an example of arthrodia, for the extremity of the bones are in immediate contact, especially towards the centre. The motions of this joint, therefore, are quite insensible in the healthy state; in patients who have died soon after parturition, a considerable relaxation of its union is sometimes observed; and in consequence of accidental violence and disease, a complete separation of the bones has been found, in childbed, and under other circumstances. When a disunion of these bones is produced by violence, or design as in the Cigaultean operation, the result, if not fatal, is always attended with much suffering to the individual; an artificial joint is occasionally formed, accompanied by permanent lameness, sometimes exfoliation. Collections of matter sometimes also form in this joint, and are followed in some cases by the same results.

Sect. II.—*Sacro-Iliac Symphyses.*

These joints differ materially in their structure from that of the pubes. The sacrum situated between the posterior extremities of the ossa innominata, has the appearance of a wedge; its sides form broad, rough, deeply marked surfaces, receiving the articular surface of each ilium, which also presents corresponding eminences and depressions. Interposed between the articulating surfaces is a thin layer of cartilage, which, when the bones are separated, invariably adheres to the sacrum, but it is destitute of that fibrous structure by which the ossa pubes are united. Its absence, however, is compensated by the bones being so deeply indented into each other, whereby they form a joint so powerful, that its separation, even after the muscles and ligaments are removed, cannot be effected without violence.

The layer of cartilage with which the articulating surfaces are furnished, becomes thicker and more relaxed during gestation. On the other hand, instances sometimes happen where it is so much absorbed, that scarcely a vestige of it can be seen; and in some rare examples, the bones become anchylosed.

Besides the union of these bones by indentation, we find that the posterior symphyses receive additional strength from numerous ligaments which are reflected over the convex

surface of the sacrum. Of these it will be necessary to take immediate notice. The first, are the two *transverse ligaments*, the upper of which extends from the posterior part of the iliac spine to the transverse process of the last lumbar vertebra; the second has a similar origin, but it is inserted into the transverse process of the first portion of the sacrum. Next to these are several ligaments which pass between the posterior spinous processes of the ilium and transverse processes of the sacrum, and are styled *ilio-lumbar ligaments*. Besides these last, the dorsum of the sacrum is covered with numerous other ligamentous expansions, which, from their irregularity, and having no determinate origin or insertion, are denominated *ligamenta vaga*. In almost every work on anatomy which emanates from the press, much ingenuity is exercised in manufacturing a new set of ligaments, or in dignifying the old ones with new names. There are two other powerful ligaments situated in the outlet of the pelvis, which are called *sacro-ischiatic*: these last arise in common from the transverse processes of the two inferior portions of the sacrum and upper part of the coccyx. The outer, which is termed the external, large, or posterior sacro-ischiatic ligament, extends obliquely downwards, to be inserted into the tuberosity of the ischium, diminishing a little in its breadth as it descends, and converting the great iliac notch into an oval foramen. Within the former is placed the small, internal, or *anterior sacro-ischiatic* ligament; it runs obliquely across the former, to be inserted into the spinous process of the ischium, and in its course, converts the sciatic notch into a foramen. These large ligaments, independently of their office in binding the sacrum and ossa innominata together, contribute to the formation of the outlet of the pelvis, to support the pelvic viscera, and to give origin to some of the perineal muscles. In the pelvis of the infant and in that of a pregnant female, this articulation is furnished with a synovial membrane; though in adult and aged persons, it is difficult of detection.

The connection of these bones with one another is so intimate as not to admit of any motion in the healthy state, unless occasioned by violence, in which case, the event is generally fatal. We are, however, sometimes called to patients where disunion of these powerful joinings has been produced by disease; and it was generally believed by the ancients, that a separation of the bones of the pelvis to some extent, always happened previous to parturition, as an effort of nature, to afford greater space for the transit of the fœtus, and thus diminish the sufferings of the mother. Some of the

moderns again contended, that this idea was as contrary to nature as to experience, and that no such dissolution of the joinings of the pelvis ever occurred. That these joints, in a woman who has died in child-bed, are frequently found in a state of relaxation, cannot be denied; and that the amplification, though limited in extent, thus arising in a pelvis slightly confined, will be permanent, and benefit the patient in her future deliveries, is not less probable. Is this position supported by the interesting fact, that a woman in whom the reproductive function has been suspended for fifteen or twenty years, is delivered of her second or third child with as much facility as a female who has had births at the usual periods of two or three years? If the obstacle to the expulsion of the fœtus in a primary labour, arose from the unyielding condition of the muscular fibres, and of the ligaments situated in the outlet of the pelvis solely, is it not more than probable, that these structures, during so long a period of sterility, would be restored to their pristine firmness? It must not, however, be forgotten, that when *extensive disunion* of the joints of the pelvis has taken place, either before or during parturition, whether in consequence of accident or disease, it in no instance affords relief, but is, on the contrary, a source of excruciating torture to the parent. Inflammation, separation, and caries, are the morbid changes to which these joints are chiefly liable.

Sect. III.—*Sacro-Coccygeal Union.*

The coccyx is joined to the sacrum by a layer of cartilage, not unlike that which unites the vertebræ; these bones are farther connected by the union of the two upper spinous processes of the coccyx, with two other processes which point downwards from the termination of the sacral canal; and this joint receives additional strength from ligaments which are reflected from the sacrum over the posterior surface of the coccyx, and from muscular fibres to which the margins of this last bone give origin. The ligaments of this joint are the anterior and posterior sacro-coccygeal, and a fibro-cartilaginous layer betwixt the sacrum and coccyx. There is nothing remarkable in the structure of this joint, except its great mobility, which contributes to enlarge the outlet of the pelvis, and facilitate the transit of the fœtus. This articulation is a species of arthrodia.

Sect. IV.—*Sacro-Lumbar Articulation.*

The junction of the pelvis with the vertebral column, is effected through the medium of the sacrum and last lumbar vertebra. Their union somewhat resembles that of the spinal vertebræ, viz. by the intervention of an annular portion of cartilage. This cartilage is thicker anteriorly than posteriorly, which renders the angle necessarily resulting from this arrangement of these two articular surfaces, more obtuse. This is termed the great angle or promontory of the sacrum, in contradistinction to a smaller angle formed by the union of the fourth with the fifth bone of the sacrum; and it is more frequently the seat of deformity than any region of the pelvis.

The articulation of the pelvis with the spine receives additional strength from the connection of two upper articular processes of the first portion of the sacrum, by ligaments, to two similar processes of the last lumbar vertebra. Here we discover *first*, the intervertebral; *secondly*, the interspinous; and *thirdly*, the ligamentum flavum placed betwixt the laminæ of the last lumbar vertebra, and the posterior part of the orifice of the sacral canal. This forms a very powerful articulation.

The motion between the pelvis and the spine is inconsiderable, and depends upon the extent to which the intermediate cartilage can be compressed. When the mobility is greater than what the intermediate cartilage can be supposed to execute, we must consider it as the effect of the inferior dorsal, and the lumbar cartilages yielding in their turn to the pressure of their respective vertebræ; or it may be attributed to the extensive motion between the pelvis and the ossa femora. The motion of which the sacro-vertebral joint is capable, is never sufficiently extensive to render the angle of this union more acute; but the convexity of the body of the lumbar column may be augmented or diminished, owing to the lumbar and inferior dorsal cartilages yielding under the action of their vertebræ, while the trunk of the body is bent backwards or forwards; or by elevating or depressing the chest, while a woman is recumbent, which are points of great moment to be attended to during parturition.

CHAPTER III.

THE MUSCLES WHICH COVER AND LINE THE PELVIS, AND CLOSE UP ITS BRIM AND OUTLET; AND THE BLOOD-VESSELS, LYMPHATICS, AND NERVES, SITUATED IN ITS CAVITY.

Some of the muscles which cover the pelvis and close up its openings, are very little concerned in parturition; of these, therefore, it will suffice to offer merely a brief enumeration. There are others, however, such as the abdominal muscles, and those that shut up the outlet, of which, in consequence of their being called into action during labour, it will be necessary to take particular notice.

Such is the importance of an intimate knowledge of the structure, connexion, and situation of the parts which line the pelvis, that without it, we should possess but a very imperfect idea of parturition; we could not anticipate the effects of the long retention of the head in the pelvis, nor should we be able to account for the numerous phenomena which occur during gestation and labour.

SECT. I.—*The parts which cover the Pelvis, and close up the Brim and Outlet.*

The superior opening of the pelvis is closed by the muscles which constitute the anterior parietes of the abdomen. These are so arranged as to form three distinct planes on each side of the abdomen; and are united towards the centre of this cavity anteriorly, by an extensive tendinous expansion, termed *linea alba*. The external oblique muscles form the first of these planes; they arise by eight heads from the lower edge of an equal number of inferior ribs near their cartilages; and are inserted into the whole of the linea alba, the anterior portion of the spine of the ilium, and crest of the pubes. That part of the muscle which extends from the ilium to the pubes, is so twisted and condensed in its structure, as to have the appearance of a ligament; and hence the terms *Poupart*, *Fallopian* or the *inguinal ligament*. The fibres of this muscle observe an oblique course, and run from behind, forwards and downwards.

Below the external we find the internal oblique muscles, which constitute the second plane. These last take their origin from the back part of the sacrum, the spinous processes of the three inferior lumbar vertebræ, the whole

length of the spine of the ilium, and from the inside of Poupart's ligament. These fibres run obliquely from before, upwards and backwards, to be inserted into the cartilages of all the false ribs, the cartilago ensiformis, and the whole of the linea alba. The tendinous expansion of these muscles divides into two layers, which inclose their respective rectus abdominis; they then reunite, and join the linea alba.

The third layer of fibres is formed by the transversales abdominis. These muscles arise from the cartilages of six or seven of the inferior ribs, the transverse processes of the twelfth dorsal, and four superior lumbar vertebrae; and from the whole inner edge of the spine of the os ilium. Their fibres run in a transverse direction, to be inserted into the linea alba and cartilago ensiformis.

Extending from the cartilago ensiformis to the angles of the ossa pubes, descending in parallel lines, and displaying three tendinous intersections, are situated the recti, enclosed in a sheath formed by the three abdominal muscles already noticed. These muscles are broader above than below, and in the unimpregnated state lie almost contiguous to each other. In advanced pregnancy, however, they recede from one another to the extent of two or three inches, in consequence of the distended condition of the abdominal parietes.

Besides the muscles which have been mentioned, there are two others of a pyramidal shape, which arise from the bones of the pubes, and are inserted into the linea alba. These are sometimes wanting.

In the abdomen, acting as a septum between this cavity and the thorax, is the *diaphragm*. In its natural quiescent state, it is convex towards the thoracic, and concave in the direction of the abdominal viscera. Above, it is lined by the pleura, and below by the peritoneum. Of the muscles concerned in respiration, this may be considered the principal; and it combines its influence with those which compose the abdominal parietes, in all the important functions of which they are susceptible, and more especially during parturition.

The *linea alba* is a white tendinous band, which extends from the cartilago ensiformis to the symphysis pubis. It is formed by the union of the tendons of the oblique and transverse muscles, interlaced with those of the opposite side, throughout their whole extent.

At the outer margin of the rectus abdominis is another line, which, from its semilunar course, is termed linea semilunaris. It is formed by the union of the tendon of the external, with that of the internal oblique and transverse muscles.

The particular structure of the parts now described, shows that they are of great importance. In the first place, we observe three distinct layers of fibres decussating each other, by which their power is greatly increased; and in the next place, we find that this triple plane, on each side of the abdomen, is united by a beautiful contexture of tendinous fibres, of great extent and power, from which the parietes themselves derive additional strength, and the subjacent organs great security. The abdominal muscles are concerned in all the great functions of the animal economy, as respiration, the circulation of the blood, the evacuation of the contents of the stomach, of the intestines, and the urinary bladder. During gestation, they support and protect the uterus; and when the period arrives at which this organ is disposed to dislodge its contents, the same muscles are called into operation by consent; and by their alternate action and reaction, aided by the influence of the diaphragm, they add greatly to the power of the uterus in emancipating the fœtus. The abdominal muscles, however, may be considered as secondary agents only in the function of parturition, as they are merely called into action with the uterus, cease to contract when this organ is lacerated, and the fœtus may be expelled without their aid, as sometimes happens after the decease of the parent.

Closing up the outlet, we find the following muscles; viz., the levatores, and sphincter ani; transversus perinæi, and coccygei. All these tend to support the coccyx and pelvic viscera *in situ;* and although they are called into operation for the support of the vagina, during the latter part of parturition, yet, of the whole, the levatores are the only muscles belonging to the perinæum that can be said to have much influence in the expulsion of the head. There is some difference of opinion among anatomists regarding the levatores; some considering them as a pair, others as a single muscle. It takes its origin from the inner surface of the pubes, upper margin of the foramen thyroideum, the thin membrane covering the obturator internus, and from the body and spine of the ischium. This muscle forms a lining almost to the whole pelvis: it proceeds from the pubes backwards, to be inserted into some of the perinæal muscles and os coccyx. In its course, it surrounds the vagina and anus, and is perforated by the urethra. Besides the agency of this muscle in the evacuation of the fæces and urine, it also, during the expulsion of the head, assists in advancing it through the outlet, upwards upon the pubes.

The pelvis is covered behind by the inferior portions of

the latissimus dorsi, sacro-lumbalis, and multifidus spinæ; on each side by the gluteal muscles; and anteriorly, by portions of the pectineus, gracilis, sartorius, tensor vaginæ femoris, rectus femoris, and obturator externus.

Sect. II.—*Muscles on the Brim, and in the Cavity of the Pelvis.*

Upon the brim are three, and in the cavity of the pelvis two pairs of muscles, besides the levator ani and coccygei already noticed. Those on each side of the brim are the psoas parvus and magnus, and the iliacus internus; and in the cavity of the pelvis, the obturatores interni and the pyriformes. Each psoas parvus arises fleshy from the sides of the two upper lumbar vertebræ, and descends by a long slender tendon to be inserted into the brim, at the junction of the ilium and pubes.

The psoas magnus arises from the side of the body, and transverse process of the last dorsal, and all the lumbar vertebræ: this muscle passes over the brim to be inserted into the trochanter minor femoris. In the venter ilii is lodged the iliacus internus, which originates from the transverse process of the last lumbar vertebræ, the inner edge of the spine of the ilium, and the anterior margin of this bone; it proceeds over the brim to be inserted into the trochanter minor, with the psoas magnus. These two latter muscles, in their transit over the brim, diminish the lateral diameter of this opening, so that in the recent subject, the diagonal line is the longest; wherefore, the fœtal head, in a strictly natural labour, presents its long diameter diagonally to the brim. It is of consequence, during the transit of the head through the brim, to keep the iliaci interni and psoæ magnæ in a state of relaxation, that they may not resist the descent of the fœtus into the pelvic cavity, which is accomplished by the patient drawing the knees upwards to the umbilicus, and by placing a pillow between them.

In the cavity of the pelvis, immediately underneath the levator ani, are the obturatores interni, which arise from one half the internal circumference of the foramen thyroideum, and pass out of the pelvis to be inserted by a round tendon into a deep fossa at the root of the trochanter major. The next pair of muscles in the pelvis, are the pyriformes: they arise within it by three tendinous and fleshy origins, from the second, third, and fourth portions of the sacrum; they pass out, becoming gradually narrower in their course, to be inserted into the root of the trochanter major. These

muscles serve to move the thighs upwards, and to roll them outwards. The long retention of the head in the cavity of the pelvis, and its consequent pressure, sometimes paralyses those muscles; and this enables us to account for the inability experienced by the patient to perform certain motions with the lower extremities, especially after protracted labours.

Sect. III.—*Blood-Vessels on the Brim and in the Cavity of the Pelvis.*

Upon the fourth lumbar vertebra, the aorta divides into the common iliacs. These descend towards their respective sides of the brim of the pelvis, and at the sacro-iliac synchondroses, each divides into external and internal iliac arteries. The external pass over the brim, and in their course run contiguous to the inner margin of the great psoas muscle. In emerging from the brim they give off the epigastric and circumflexa ossis ilii, arterial branches of considerable magnitude. The first of these passes behind the round ligament, and towards the pubes; it afterwards runs between the peritoneum and abdominal muscles; and then penetrates the sheath of the rectus abdominis, and proceeds upwards in the centre of this muscle to innosculate, in the epigastric region, with the ramifications of the internal mammary artery. The circumflexa ossis ilii nearly equals the epigastric in size: it passes into the abdominal cavity at the anterior extremity of the crista ilii, between the transversalis and internal oblique muscles. This branch is distributed to the psoas, iliacus internus, and sartorius; and to the under portions of the oblique and transverse abdominal muscles; and it forms anastomoses with the epigastric, inferior intercostal, and lumbar arteries.

The internal iliac arteries are of greater consequence in an obstetrical point of view, than the external; for all their subdivisions are ramified on the organs and parts connected with the pelvis. Each of these trunks extends along to the great sacro-ischiatic notch, where it divides into several branches, some of which are of considerable size: they are nine in number, viz. the gluteal, ischiatic, common pudic, obturator, two sacro-lateral, ilio-lumbar, uterine, and hemorrhoidal. The first four pass out of the pelvis, three of them to be distributed to the parts which cover and are connected with it; and the fourth, the pubic, to return into the pelvic cavity.

Of the branches of the internal iliac, the gluteal is the

largest. It passes through the upper part of the great sacro-ischiatic notch, and is chiefly ramified on the muscles which bear its name. The ischiatic is next in size; it proceeds from the pelvis at the under part of the ischiatic notch, the pyriformis muscle being interposed to it, and the gluteal artery. It is ramified upon the muscles on the back part of the pelvis and thigh. In its origin, the obturator artery is not very regular; for it is sometimes given off by one of the other branches, and not by the trunk of the internal iliac. While in the pelvis, it runs under the inner margin of the great psoas muscle, and perforates the upper edge of the ligamentous production, which closes the foramen obturatorium. The pudic arteries have a peculiarity in their course, which has never been explained; they pass out of the pelvis at the under part of the iliac notch, and at the lower edge of the pyriformis; but they no sooner make their exit from the pelvis, than they immediately re-enter it between the sacro-ischiatic ligaments. Their particular distribution, as well as the course and ramification of the spermatic arteries, which are also found in the pelvis, will be described with the remaining branches of the internal iliac artery.

The femoral vein enters the abdomen under the ligament of Poupart, and then becomes the external iliac vein; after which, it receives the epigastric and circumflex iliac veins, and sometimes the obturator. It passes along the brim of the pelvis upon the inner or pubic aspect of its corresponding artery, on the margin of the great psoas muscle. The internal iliac vein is situated behind its concomitant artery, and is formed by veins which correspond to the different branches that are given out by that artery, all of which are furnished with valves. A little lower than the division of their corresponding arteries, the external and internal iliac veins unite, to constitute the common iliac veins. These mount upwards by the right side of their respective arteries, and, a little below the bifurcation of the aorta, unite to form the inferior cava.

Without due attention to the formation of the pelvis, at the brim, we might *a priori* suppose, that the large vessels situated at this point, would suffer considerable pressure during the transit of the head. From this, however, they are effectually protected, especially in a capacious pelvis; for the promontory of the sacrum, by projecting a little towards the pubes, has on each side of it a considerable depression, which receives the large vessels entering the pelvis, and secures them from compression. But in a pelvis of limited capacity, there are two points at which these vessels may be

compressed. The external iliacs of either side, where they are situated upon the margin of the great psoas muscle, are exposed to pressure from the back part of the head; and when the head is somewhat advanced through the superior opening, and the face begins to incline towards the sacrum, the internal iliacs must suffer long and severe pressure, for the semi-version of the head in the pelvis always takes place very slowly, when this cavity is at all contracted.

The internal iliac vessels are very differently situated from the external. From the moment the whole head, or indeed a large proportion of it, is lodged in the pelvic cavity, the internal iliacs are exposed to a degree of pressure, which must prove more or less injurious to the soft parts, according to the dimensions of the fœtal head, the period of its retention, and the capacity of the pelvis. Certainly, the circulation in these vessels is never completely interrupted; but it is frequently so far retarded, as to cause such tumefaction of the linings of the pelvis, as to constitute of itself an insurmountable barrier to delivery. And every practitioner knows, that this kind of obstruction to the transit of the fœtus is not the least formidable of those which may affect the safety of the mother.

Sect. IV.—*Nerves of the Pelvis.*

In the venter ilii, upon the surface of the iliacus internus and psoas magnus muscles, we find four branches of nerves, which are sent off from the first, second, and third lumbar. These branches supply twigs to the muscles on the brim, and afterwards pass over the pelvis; some of them through the abdominal ring to be ramified on the external genitals; and the rest under the femoral ligament, to be dispersed upon the integuments and muscles upon the fore part of the thigh.

The next nerve to be noticed is the *anterior crural*, which is of great size, and is formed by the second, third, and fourth lumbar. At its origin, it lies under the great psoas, and afterwards runs between this muscle and the iliac internus, being covered in part of its course by its accompanying artery. It passes over the brim under the tendon of the external oblique, to be ramified upon the muscles of the fore and lateral parts of the thigh. About three-fourths of an inch below the brim, we observe the *obturator nerve*, which has its origin from the third and fourth lumbar; it runs parallel with the brim to pass out through the upper margin of the foramen, whose name it bears.

In the posterior part of the pelvis, the nerves are large

and numerous. We have first, the fourth and fifth lumbar, proceeding towards the iliac notch; the former passing under and the latter over the gluteal artery; they then unite and constitute a strong cord, which receives the first, second, and third sacral nerves. All these form a large plexus which gives origin to the *common pudic*, and *gluteal nerves;* and also to the largest nerve in the body, styled *sacro-ischiatic.* This last is flat at its commencement, a formation that renders it less exposed to pressure while in the pelvis, from which it passes by the iliac notch under the pyriformis muscle. Lastly, the fourth and fifth sacral nerves, after transmitting twigs to the ligaments and muscles of the coccyx, are distributed upon the extremity of the rectum, and the muscles and skin which surround this canal.

As all of these nerves are more or less exposed to pressure during gestation and parturition, it will be necessary, with a view to explain various uneasy feelings of which females complain at these periods, to consider the relation which they bear to the gravid uterus, and to the fœtal head in its transit. The pressure made during the early months of pregnancy, upon the nerves of the pelvis in consequence of the gradual enlargement of the uterus, causes the general uneasiness felt in the pelvic cavity, and the frequent inclination for micturition. The latter may be partly ascribed to the accommodation afforded to the bladder being more limited at this period. When the uterus ascends from the pelvic cavity upon the brim, the lumbar nerves, and also the superficial branches situated upon the spine and venter ilii, are liable to be compressed; which explains the cause of the numbness of the lower extremities, and the uneasiness felt in the lumbar and iliac regions, for which immoderate venesections are too frequently and improperly resorted to. Pressure upon the pelvic nerves, and upon the vesica urinaria must likewise cause that loathsome stillicidium or incontinence of urine complained of so frequently in the latter months. At this period too, some individuals are frequently affected with spasm of the lower extremities, owing to pressure upon the anterior crural or obturator nerves. In the early part of parturition, when the head descends upon the brim, these large nerves are also likely to be acted on, and hence the uneasiness which is felt along the fore part of the thighs.

During the descent of the head, the obturator nerves suffer more or less compression in proportion to the size of the head and the dimensions of the pelvis. From the moment the head enters the brim, the nerves situated in the posterior part of the pelvis are exposed to considerable pressure; and

hence to a certain extent, the excessive pain felt in the back, and which increases in severity until the head is excluded from the pelvis. When the face is lodged in the hollow of the sacrum, and the occiput begins to emerge from the outlet, there are, in most cases, violent cramps of the lower extremities, and the fæces escape involuntarily; the former are occasioned by pressure upon the great sacro-ischiatic nerves; and the latter, by the compression of the fourth and fifth sacrals, which are chiefly ramified upon the extremity of the rectum.

Sect. V.—*Lymphatics of the Pelvis.*

The inguinal glands are divided into two chains, the one placed in the angle between the inferior extremity and the abdomen; and the other, about two inches down on the fore part of the thigh. These glands, which are from eight to twelve in number, receive the superficial and deep-seated lymphatics of the extremity; most of the superficial set of the external genitals; and also the subcutaneous lymphatics from the lower part of the abdomen, loins, nates, anus, and perinæum. From the groins, the lymphatics pass under Poupart's ligament, accompanying the external iliac vessels. From this point, some proceed through the external, and others through the internal iliac plexus of glands. The remainder, belonging to the lower extremities, descend at the sides of the pelvis, to pass through the glands situated on the internal iliac vessels, where they unite with the lymphatics coming from the pelvic viscera. The whole then join those placed on the brim of the pelvis, and constitute on each side a large plexus, which extends from the inguinal ligament to the third lumbar vertebræ, where they unite to form the *thoracic duct.*

During gestation, the lymphatics immediately connected with the uterine system, become considerably enlarged; and the various clusters of glands placed at different points within the pelvis, are also increased in size; yet, it is asserted that they are not exposed to pressure during parturition. The contrary, however, must appear evident, owing to the changes just mentioned; and the fact is supported by the occurrence after parturition, of inflammation and suppuration of one or other of the superficial glands at the bottom of the abdomen, and of one or more glands belonging to the internal iliac cluster.

CHAPTER V.

THE EXTERNAL ORGANS OF GENERATION.

These might be divided into superficial and deep-seated, and include the Mons Veneris, Labia Pudendi, Nymphæ, Clitoris, Meatus Urinarius, Frœnum Labiorum, and Perinæum. In professional conversation, the whole of these are often comprehended under the terms *pudendum*, *vulva*, or external parts. We are not yet aware that these organs possess any influence in the process of conception; and as they would seem to be passive during parturition, and their use therefore conjectural, we shall be less particular in speaking of their structure.

Sect. I.—*Mons Veneris.*

This is the rounded prominent part covered with hair, and placed on the insertion of the recti muscles and symphysis pubis. It consists of the common integuments, and owes its elevation partly to the bones, and also to a quantity of adipose matter, inclosed in the cellular membrane. It is about three inches in breadth, and two in depth. Its degree of prominence is regulated by a variety of circumstances,—it is more so in young vigorous females who are not matrons, than in such of the sex as are advanced in years, and have borne many children: during coition, and on the approach of the menstrual period, it is more elevated than when the individual is not under the influence of any excitement; it is also more prominent in young females in tropical climates, than in persons of equal age in this country. In elderly women, it becomes flattened.

The appearance of down or hair on the mons Veneris, marks the age of puberty, and hence the term pubes which is often applied to it. It is supposed to prevent any injurious effects which might result from pressure during the sexual intercourse.

Sect. II.—*Labia Pudendi.*

These are also styled alæ majores, and are the two columns which descend from the mons Veneris, to within an inch of the anus, where both are united. They are duplicate continuations of the part described in last section, inclosing a proportion of adipose matter and numerous mucous glands. The opening between these columns is styled *fossa magna*, in

which are contained several of the external genitals. Towards the posterior union of the labia, the opening between them becomes larger and deeper, and from its resemblance to a small boat, is called *fossa navicularis.* Externally, the labia are covered with hair; internally, they are lined with a smooth shining mucous membrane, of a vermilion colour and great sensibility. This membrane is very vascular, and is abundantly supplied with glands and follicles, which furnish a considerable quantity of mucus to protect the inner surface of the organs from the effects of friction, and from the acridity of the urine.

The labia are generally of the same size, but sometimes the one is a little larger than the other. With regard to their prominence or flaccidity, they are influenced by the same causes which affect the mons Veneris; under proper management, they are susceptible of great distension without suffering injury, as happens during the transit of the fœtus. They do not possess any muscular fibres, so that their restoration to their original small size depends entirely on their own elasticity; on which account, they continue somewhat enlarged and considerably relaxed for some time after parturition. These appendages protect the parts which they cover from the effects of friction, and prevent absorption, arising from exposure to the air.

Sect. III.—*Nymphæ.*

These parts are sometimes also denominated labia minora, or alæ minores, in contra-distinction to the organs last described. In most cases they are only seen by separating and everting the labia pudendi, when they present themselves in the form of small folds, apparently of the membrane which lines the internal surface of the alæ majores. This lining, however, merely constitutes their external covering, for they seem to be composed of erectile tissue, styled *corpus cavernosum;* but chiefly of a congeries of blood-vessels, as may be seen by injecting the pudic arteries.

In the living subject these bodies are distinguished with facility; but in the dead, they often collapse so much as to be rendered very diminutive. In infants they are greatly developed. They are continuous with the prepuce and glans clitoridis, extend obliquely on the inner surface of their respective labium, and terminate upon a line with the meatus urinarius: the space between them is termed *vestibulum.* Although, generally speaking, these organs are so small in females of this country, among the Hottentots, however, they

are so much elongated as to descend from four to five inches below the margins of the labia. The cause of this elongation is still unknown, as extension is not practised; and we are also ignorant of the utility of such conformation, unless it be to serve as a defence against violence from the other sex; it seeming next to impossible for a man to cohabit with one of these women without her consent, or even assistance. This elongation is not altogether limited to the Hottentots, for it is occasionally observed to some extent among individuals in this country, and very frequently in the negroes, Moors, and Copts, who cause the organs to be circumcised.

When the passions of the individual are excited, the nymphæ become enlarged and tense. They are supposed to direct the urine from the urethra, and prevent it flowing over the external parts; and they contribute to enlarge the vagina during the exit of the fœtus, for at this time they are quite obliterated.

Sect. IV.—*Clitoris.*

This is a small body of a vermilion colour, which projects from the symphysis pubis at the commencement of the labia pudendi. Like the male penis, it possesses two corpora cavernosa; but it wants the corpus spongiosum. Each corpus cavernosum has an erector muscle proper to itself. These bodies, with their erector muscles, arise from the crura of the ischia and pubes, and are fixed by a suspensary ligament to the symphysis pubis. The corpora cavernosa unite anteriorly to form the *glans clitoridis;* which, like that of the the membrum virile, is furnished with a portion of loose skin, called prepuce; but the female glans is impervious.

In size, this organ varies exceedingly, at least in females of this country. It is not to be seen in most instances, except by separating and everting the labia; occasionally, however, it projects beyond these appendages, which occasions much inconvenience to the individual; and in children it is much more conspicuous than in adults. Its size in females of this part of the world varies from a quarter to a full inch in length. Among the natives of warmer regions, it has been met with, in some instances, of an incredible magnitude, equalling even the male penis. In some countries, where this appendage has been met with of unusual length, the author has been assured that females so endowed have been known to indulge in a sort of intercourse with each other to supersede the embraces of the male. This unusual size of the clitoris has led to the supposition that individuals to whom nature has been so bountiful were hermaphrodites.

We know little of the use of this organ, farther than that it is the seat of exquisite sensibility during coition, or when, from any cause, the passions are excited; on which occasions, similar to what was observed in speaking of the rest of the external genitals, its cells become distended, and the organ itself enlarged. Titulation or friction causes the distension of this body, which is followed by a discharge from the vagina; and this practice has been known to be persisted in by some young persons to such an extent, as to produce marasmus; for the removal of which, and the prevention of other injurious effects, the excision of the clitoris has proved effectual. The erection or distension of this organ may be said to depend on venereal orgasm or attrition, and consequent plenitude of its cells.

Sect. V.—*Meatus Urinarius.*

This aperture is discovered near the termination of the nymphæ, better than half an inch below the radix clitoridis. In the living state, it may generally be distinguished by a spongy caruncula or eminence that surrounds it: in its vicinity a minute examination detects several lacunæ which afford mucus to protect it from the acridity of the urine. This caruncula is styled *corpus glandulosum*, or *glandula prostata mulierum;* its situation ought to be remembered, as it will direct us to the meatus, except in cases where the natural texture of the parts has been changed by disease.

The meatus is the termination of the urethra, which is far more capacious than that of the male, and in the female is merely from one and a half to two inches in length. It is a muscular erectile canal, and when a finger is introduced into the vagina, it can be felt, like a cord ascending obliquely behind the symphysis pubis, to which it is attached. Its inner surface is covered with a very fine sensible membrane, which is abundantly supplied with lacunæ, that furnish mucus to defend it during the flow of the urine.

In the unimpregnated state, the urethra, in its course towards the bladder, is very slightly curved; but, during gestation, its direction is affected by the particular position of the uterus. During the early months, the urethra will rise almost perpendicularly behind the pubes; but in advanced gestation, the bladder is often thrown forwards over these bones, which must occasion a considerable curve in the urinary canal, a circumstance that ought to be remembered in passing the catheter.

Sect. VI.—*Fourchette, or Frænum Labiorum.*

This tissue unites the labia pudendi at their perinæal extremities. It is merely a band of condensed cellular membrane, which is exceedingly sensible. In primary labours, it is sometimes lacerated under the best management, and is then the source of considerable irritation to the patient. The frænum adds to the strength of the posterior commissure of the vagina, and enables it to support the effects of distension during the transit of the fœtus.

Sect. VII.—*Perinæum.*

This term is applied to the part between the posterior commissure of the vagina and the rectum, on the supposition that it is continually covered with moisture; it is sometimes also termed anterior perinæum, to distinguish it from the space between the anus and the coccyx, on which anatomists have conferred the name *posterior perinæum.* Its breadth in the quiescent state, is about an inch and a quarter, but during parturition, it is extended from four to five inches; and in consequence of its being chiefly composed of muscular fibres, its contraction is rapid. From the vagina to the anus, something resembling a seam runs in the centre of the perinæum, which is termed *raphe.*

During parturition, this part demands the greatest attention from the practitioner, in order to prevent a laceration of it, which has been known to take place under the best management. The perinæum supports the contents of the pelvis, and closes up the outlet.

The external genitals are abundantly supplied with blood from the common pudic arteries, which are almost entirely expended on these organs by minute ramifications. The great sensibility of the external parts is a proof that they are equally well furnished with nerves, which have the same name and course with the arteries. Some of these have a similar origin with the great sacro-ischiatic nerves, while others are branches from the uterine. Their absorbents pass to the inguinal, iliac, and lumbar plexus.

Among the diseases which may attack the external parts, may be mentioned, inflammation of the phlegmonoid and erysipelatous kinds, syphilis, and pruritus. The most frequent diseases and accidents of the labia are, schirrous, steatomatous, and polypous tumours; warty excrescences, œdema, herniæ, sanguineous effusions, and lacerations. Besides elongation, the nymphæ are subject to the same affections with

the labia. The clitoris sometimes becomes enlarged or cancerous. Independently of lacerations, the perinæum is occacasionally the seat of hernia and infiltration.

CHAPTER VI.

ORGANS SITUATED IN THE PELVIS.

On dividing and reflecting the abdominal parietes, the first organ which frequently commands attention, is the vesica urinaria; immediately behind this is placed the uterus with its appendages; and posterior to these, the rectum. The whole are intimately connected through the medium of cellular tissue, vessels, nerves, and the peritoneum which covers them. The peritoneum is reflected from the insertion of the abdominal muscles over the inner surface of the pubes, and descends between these bones and the urinary bladder, to the body of which it also affords a covering. From this last organ, it proceeds downwards to cover the cervix, from which it ascends over the anterior surface of the body, and fundus of the uterus. It then descends upon the posterior surface of the uterus, and is reflected over the rectum and back part of the pelvis.

In its texture, the peritoneum is firm and compact, and consists of dense cellular membrane. Its surface, which adheres to the muscles and viscera, is rough; the free surface is smooth, and always covered with moisture, which is exhaled by its own vessels, and prevents it forming adhesions in the healthy state. This membrane possesses great elasticity, as is proved during the presence of gestation, large ovarian tumours, corpulency, ascites, and herniæ; and after the causes of distension are removed, it speedily returns to its original state. The peritoneum contributes to protect the viscera; and in consequence of its free surface being always moist, to prevent the injurious effects of friction.

The urinary bladder and rectum must be noticed under this head, from their intimate connexion with the internal organs of generation, and their direct influence, under certain circumstances, upon the process of parturition.

Sect. I.—*Vesica Urinaria.*

Behind the bones of the pubes, and connected to them and to the os uteri and vagina by cellular membrane, is this or-

gan. When empty or nearly so, it occupies the under and fore part of the pelvic cavity; but when somewhat distended, it rises above the symphysis pubis, and occasionally even to the umbilicus. It is more of an oval figure in the female than in the male; and its capacity is greater, from its contents being occasionally permitted to accumulate.

Besides the peritoneal, the vesica urinaria has three other coats, viz. the muscular, cellular, and villous. There is no prostate gland. The blood-vessels of the bladder are from the common pudic, and partly from the umbilical. Its nerves come from the great sympathetic and sacral. The absorbents join the iliac glands. This viscus forming a reservoir for the urine, is excited to discharge its contents, either in consequence of its fibres being stimulated by distension, or by the acrid quality of the urine itself; and this expulsive action is aided by the pressure of the surrounding viscera, and by the agency of the abdominal muscles. The contiguity of the urinary bladder to the uterus, explains the frequent inclination of the patient to void the urine during parturition, owing to the consent between the two organs. Among the diseases of the bladder may be enumerated calculus, scirrhus, inflammation, polypus, perforation from long continued pressure during labour, incontinence, suppression, hernia, and excrescences in the urethra.

Sect. II.—*Uterus.*

This organ is situated between the urinary bladder and rectum, to both of which it is connected at its cervix, by the peritoneum and loose cellular membrane. It floats freely in the brim of the pelvis, assumes an oblique position, its inferior extremity being directed rather backwards; but in this particular, much depends on the condition of the adjoining viscera. In its natural situation, the most depending portion, or the extremity of the cervix, is at least from two and a half to three inches from the os externum, and projects like a nipple into the upper part of the vagina. It is of a pyriform shape, prominent posteriorly, but flattened anteriorly. In the healthy virgin state, the uterus is firm and plump, and its whole length is about two inches and a quarter; after child-bearing, it is nearly three inches in length; and in old age, when the functions for which it is destined have ceased, it rather diminishes in size. Its thickness in vigorous females, is from a half to a full inch; but in individuals who have not menstruated, although past the age at which they should have done so, the uterus does not ac-

quire the same size as in those persons in whom this function has been established. The virgin uterus weighs from seven to eight drachms, that of a matron an ounce and a half.

By anatomists, this viscus is divided into fundus, corpus, cervix, and os, or aperture. All above the Fallopian tubes, is termed *fundus*, which has two angles, and is from one and a half to two inches in breadth. Between the tubes and the narrow part of the uterus, is the *corpus* or body, which is rather more than an inch in breadth; the narrow part, which is the *cervix*, is from half an inch to three quarters in breadth. In the extremity of the cervix, is the *os uteri*, os internum, or os tincæ, so called from its resemblance to the mouth of the tench fish. In the virgin state the cervix is fully an inch in length; and in circumference it may vary from that of a large pencil case to the size of the little finger or more. The uterine aperture in the virgin state is firm, smooth, and polished, and its size equals the orifice of the male urethra. After child-bearing, it becomes harder, and more irregular in its margins; and it continues for ever after, sufficiently open to admit the summit of the little finger.

When examined with the knife, the uterus is found to be dense and compact in its structure, made up of a beautiful intertexture of muscular fibres, condensed cellular membrane, vessels, nerves, and lymphatics. The peritoneum descends along the anterior surface of the uterus about three-fourths of its whole extent, the posterior side is entirely covered by it, but it is not reflected over its aperture. The muscular tissue is best displayed by parboiling the organ,—but it is by no means obvious. Notwithstanding the indistinctness of its muscular structure in the unimpregnated state, some anatomists have affected to describe the arrangement of the fibres; but when we consider that this cannot be satisfactorily accomplished even in the gravid uterus, a description of their course in the unimpregnated organ must be the work of fancy. The uterus is freely supplied with lymphatics, which, like the muscular fibres, are to be satisfactorily distinguished in the gravid state only. Though no glands can be discovered in this viscus, yet they must exist, more especially in its cervix, since this is the part first affected in cancer; and since the uterus performs, among other functions, that of a glandular organ.

The cavity of the uterus is triangular, and much smaller considering the size of the organ, than could be expected—being scarcely large enough in a woman who has never been

pregnant, to contain the half of an almond. It is lined with a fine villous membrane, which is perforated by the numerous minute vessels that furnish the catamenia. On the internal surface of its cervix, are two longitudinal lines, the one placed anteriorly, the other posteriorly; and towards the sides of each are numerous *rugæ*, which follow an oblique course. These corrugations are formed partly by the substance of the cervix, and partly by its lining membrane; and between them are placed many small follicules, which, with the minute vessels terminating on the internal surface of the cervix, serve to keep it continually moist. The rugæ of the cervix are sometimes but not always obliterated by child-bearing.

This organ derives its arteries from two different sources. Its fundus receives the spermatic, which are sent off from the aorta, a little below the renal arteries. The body and cervix uteri are supplied by the uterine and pudic arteries, which are branches of the internal iliac. In their origin, the spermatic are by no means regular, as they are sometimes derived from the renal, and also, though rarely, from the diaphragmatic arteries. They run in a tortuous manner under the peritoneum, upon the surface of the great psoæ muscles; and on reaching the brim, they pass to the fundus uteri between the layers of the ligamenta lata. These two vessels penetrate the substance of the organ, and communicate freely with each other, forming numerous anastomoses between them. From the sacro-iliac synchondroses, where they are given off by the internal iliac, the uterine arteries pass to the inferior extremity of the cervix uteri: at this point, they enter the substance of the uterus, and innosculate with each other; and they are also reflected upwards upon their respective margins of the organ, forming numerous anastomoses with the spermatic arteries. The pudic arteries supply some branches to the os and cervix uteri, but they are chiefly ramified on the vagina.

The veins have the same denomination as the arteries: in their termination, the right spermatic proceeds to the ascending cava, a little below the emulgent of the same side; but the left terminates in its corresponding renal vein. The hypogastric or uterine veins join the internal iliac.

This viscus is abundantly supplied with nerves, which enables us to account for its powerful influence while in a diseased state, upon many other organs. The violent headache, and distressing vomiting which so frequently accompany derangements of the catamenia, are proofs of the sympathy

that exists between it and other important parts. In the unimpregnated healthy state it is not very sensible. The morbid conditions of the catamenia have more influence in producing derangement of the general system, and affections of particular organs, than structural lesions of the uterus. I have known this organ to be in a scirrhous state for many years, to be converted into bone, or a cartilaginous tumour of such magnitude as to give the individual the appearance of being far advanced in pregnancy; and yet she not only suffered comparatively little, but even enjoyed a great share of good health. It is not an organ that is necessary to life, since so many cases of its removal are now recorded, without such deprivation being succeeded by any unpleasant influence, beyond the extinction of the procreative function. In some cases where the body of the uterus and the ovaria were removed, the catamenia have re-appeared.* Its nerves are derived from the renal and hypogastric plexus, and from the great sympathetic, intercostal, and sacral, and recently proved by the dissections of Professor Tiedemann and others† to form many ganglia and plexus, not only in the body, but also in connection with the cervix of the uterus, whence numerous branches are distributed to the other pelvic organs, and to the external genitals. The lymphatics, which are very numerous, though indistinct in the unimpregnated state, pass into the iliac cluster of glands.

Among the important functions with which the uterus is endowed, we may mention the menstrual secretion: it constitutes the temporary residence of the ovum, which it receives soon after conception, and brings to maturity; and when the parent is on the eve of giving birth to a new being, it takes on an action peculiar to itself, for the emancipation of the fœtus.

The diseases of the uterus are numerous. It may be the seat of inflammation, and all its consequences; cancer, fleshy tubercles, spongoid tumour, calculi, polypi, hydatids, aqueous secretions, worms, prolapsus, hernia, and various morbid conditions of the catamenia.

Sect. III.—*Ligamenta Lata.*

These appendages are formed by the reflections of the peritoneum on the anterior and posterior surfaces of the uterus, uniting at the margins of this viscus, and proceeding towards their respective sides of the pelvis, to which they

* Dublin Hosp. Report, vol. iii.

† Phil. Trans. Lond. 1841.

are attached a little anterior to the junction of the ilia with the sacrum. As they extend from the whole length of each side of the uterus to the ilium, they completely divide the cavity of the pelvis into anterior and posterior chambers. Each of them in passing to the sides of the pelvis, forms an anterior and a posterior pinion or fold, which are well displayed when the uterus is raised a little upwards, and these reflections are extended. The posterior pinions contain the ovaria, and the anterior the Fallopian tubes. These loose folds contribute, with other *media*, to support the uterus *in situ*.

Sect. IV.—*Ligamenta Rotunda.*

These parts, improperly termed ligaments, are rather two vascular cords sent off from the angles of the fundus uteri, and are obviously of the same structure. They are embraced by the anterior layers of the broad ligaments, until they reach the brim of the pelvis, where they pass through the ring of the external oblique muscle, to be distributed on the groins and mons Veneris. Each of them is little thicker than a crow quill, but they become greatly enlarged during gestation; and, besides fibres, consist of an artery, vein, nerve, lymphatic, and a process of the peritoneum.

As to the function of the foregoing appendages, this point is still contested. They have long been supposed to act as ligaments for the support of the uterus, but the displacement of this organ, even from trivial causes, proves that their influence in this way is inconsiderable. Sir Charles Bell ascribed to the round ligaments a contractile power, which enabled them during coition to place the os uteri in a favourable position for receiving the semen masculinum; but were they possessed of such influence, the effect would be to bring the fundus uteri nearer the pubes, and throw the os tincæ too far towards the sacrum, the reverse of what might be desirable. Moreover, from females having conceived where the penis had not entered the vagina, or where the male was affected with hypospodias, the position of the uterus would seem to have little if any influence in the success of this function, and the foregoing opinion to be altogether gratuitous. By the same writer they are supposed to be the tendons of uterine fibres which cause some change in the uterus antecedently to labour; by which, in occasional instances, the abdominal tumour is so remarkably reduced in size, that pregnancy even would scarcely be suspected. Although, in all probability, there be some important physiological point latent here, we are yet ignorant of it.

Sect. V.—*Ovaria.*

These organs derive their name from their being the receptacles of numerous vesicles: they are two oval bodies, somewhat convex on both sides, enveloped in the posterior pinions of the broad ligaments, at the distance of little more than an inch from the sides of the fundus uteri; to which they are attached by small ligamentous cords, styled ovarian ligaments. The ovaries are perfectly free, except where they are attached to the margin of the broad ligament. Their position varies: in the fœtus they are placed upon the great psoæ muscles; during pregnancy they are carried up into the abdomen, and after delivery they are found in the iliac fossæ. They are firm, plump, and large in a healthy virgin, better than an inch in length, half an inch in breadth at their broadest extremity, which is next the uterus, and weigh from a drachm to four scruples. In the fœtus they are comparatively larger than in the adult. During gestation these organs do not materially increase in size, although the contrary has been stated: in many instances there is indeed no obvious enlargement. In persons who have had many children they exhibit cicatrices on their surfaces, and in very old women they become shrivelled and atrophied. In children and young females who have not attained the age of puberty, they are very white, and their surface is smooth and polished. Previous to the appearance of the catamenia, these organs are small; but afterwards their development is rapid. Sometimes one is larger than the other; occasionally also, they differ in shape.

Subjacent to their peritoneal covering is another tunic of a dense fibrous texture, adhering so intimately to the former that they cannot be separated: within these is contained what is styled the *stroma* of the organ, which is spongy and vascular, and encloses the vesicles of De Graaf. These bodies, although called after this writer, were known to Vesalius and Fallopius: they are furnished with two coats, the external thin, dense, transparent, and vascular, adhering to the structures of the ovary; the internal tunic is softer and more opaque, enclosing a thick whitish-yellow albuminous fluid, chiefly composed of granules, which are particularly condensed in the neighbourhood of the ovum. Except when diseased, I have never seen the largest vescicles exceed in size a coriander seed; and while a few only are of this magnitude, giving the surface of the ovary a tuberculated appearance, the remainder are greatly smaller. Almost every writer gives a different account of their number: by some they have been said to vary from four to fifty; but I have never

been able to distinguish more than nine in one ovary, while in other instances four only could be seen. Writers are also at variance as to the earliest period at which they are to be discovered; for while Dr Rigby observes that they do not commonly become visible until the seventh year, Professor Carus of Dresden informs us that they may be detected in the ovaries of the fœtus in utero, a discovery which I have been able to confirm. When the ovaries were affected with induration, or had undergone some other change, they were found by Cruveilhier to be destitute of Graafian vesicles.

These vesicles contain the rudiments of our race, in each of which, according to Barry, there is but one ovulum, which in the commencement is placed in the centre of the Graafian vesicle; but in its progress to maturity it approaches the internal tunic, imbedded in a mass of granules. The ovum forms a spherical body, the 120th part of an inch in diameter, furnished with a thick transparent coat, which is named by Wagner, the chorion. This last membrane surrounds the yolk, which contains the germinal vesicle, thought to be about the 720th part of an inch in diameter. Within this last vesicle is the germinal spot of Wagner, said to constitute the 2500th, or 3500th portion of an inch. The primary changes after an efficient coitus are supposed to commence in the germinal spot.

Of all the genital organs, the ovaries are the most important; since their absence, whether as a congenite defect, or the work of art, leads to the development of extraordinary changes. The catamenia either do not appear, or they cease with the removal of these organs, sexual desire is extinguished, the procreative function is suspended, and some appearances and habits peculiar to the female, are exchanged for others more characteristic of the male sex. The ovaries, independently of their constituting reservoirs for the *ovula*, may be considered the seat of fœcundation; an opinion supported both by experiments performed on the lower animals, and by pathological observations in the human subject, which will be noticed in a subsequent chapter.

One ovarium, provided it be sound, seems not only sufficient for all the purposes of generation, but to enable an individual to produce children of both sexes. The diseases to which these organs are liable, are inflammation and its consequences, especially enlargement and induration, in which latter case, they sometimes become atrophied and blanched; the different varieties of malignant disorganization, though not so frequently as some other morbid mutations; in some rare instances, when scarcely so large as a pigeon's egg, I

have found them ulcerated; they have been known to contain structures like teeth and hair; they sometimes constitute enormous tumours which are made up of cysts, that contain a fluid varying in consistence from serum to that of jelly; fleshy tubercles, dropsy, and scirrhus.

Sect. VI.—*Tubæ Fallopianæ.*

These tubes are named after Fallopius, who first described them, but they were known to Hippocrates. They are included in the upper margin of the broad ligaments, anterior to the ovaries, and originate from the angles of the fundus uteri. To near their middle, in advancing from the uterus, they are straight; but in their course towards the sides of the pelvis, they are waving or tortuous, and upon the brim float loosely among the other viscera. Their length is about four inches. At their uterine extremity they are so contracted as scarcely to admit a bristle; but their calibre gradually increases to their fimbriated termination, where they are sufficiently capacious to admit a crow quill, and form direct openings into the abdominal cavity.

These tubes, from being enveloped in the broad ligaments, are partly composed of the peritoneum, but chiefly of a spongy fibrous texture, with a continuation of the mucous tunic of the uterus for their inner lining. Externally, these fibres are said to run longitudinally, and the internal stratum to be circular; but anatomists are at variance as to the presence of muscular structure, though, from the functions they perform, it is natural to infer its existence. These canals afford the only example in our race of a mucous and serous membrane uniting by continuity of structure, and of the former terminating in a shut cavity. The tubes convey to the ovaria some principle in the semen; and from them they transfer into the uterus the fœcundated ovulum; but on their functions we shall enlarge under the head of Conception. They are indistinct until the fourth month of gestation; at which period, also, they become pervious, and they are comparatively larger in the fœtus than at a subsequent period. On their inner surface, their lining is arranged into longitudinal plicæ or folds, which may enable the tube to expand during the transit of the ovum.

Sect. VII.—*Vagina.*

This is a strong elastic canal, which extends almost in the axis of the cavity and outlet of the pelvis, from the uterus

to the pudendum. It is united to the os uteri about five lines above its margins; and this union is somewhat higher on the back than on the fore part of the cervix; which causes the posterior to be more distinctly felt than the anterior margin of the os tincæ, and the vagina to describe a slight angle with the uterus. The pudendal extremity is united by various structures to the upper part of the arch of the pubes, and the lower part of the symphysis. It is placed between the bladder and rectum, to both of which it is intimately connected. It is contracted at its uterine but more so at the pudendal extremity, and is wider towards the centre. Particular circumstances, as connubial intercourse and child-bearing, influence its length and capacity. In the virgin state it is rather better than three inches in length, and less than an inch in diameter.

The parietes of this canal consist of two strong fibrous layers, with an erectile tissue interposed, the external being the stronger. Around the erectile tissue is a tolerably thick layer resembling the structure of the *dartos* condensed, which may be endowed with a vermicular movement, and aid in transferring the semen towards the uterus. Internally, it is lined with a mucous membrane, which is furnished with a thick epithelium: except at its pudendal extremity, the presence of muscular structure is denied by some anatomists. About a fourth of its upper and back part is covered by the peritoneum.

Posteriorly, the vagina is thin; and it is so also at the anterior and upper part. Internally, on the posterior walls, but more especially on the anterior, a distinct line or raphe extends along its whole course, styled columns of the vagina, whence the transverse rugæ, formed by the mucous membrane, extend. These prominences are numerous in infants and virgins, and more elevated upon the lower than the upper part of the vagina, where they remain distinct even after child-bearing, although they are effaced upon the upper part of the canal. The rugæ are supposed to increase the venereal sensations, and to contribute to enlarge the vagina while in a state of dilatation, which may happen to a great extent without injury to its structures, as is proved by its condition during the transit of the fœtus. On the internal tunic numerous glandular follicles terminate by open mouths, which, when the passions are excited, furnish a large quantity of mucus.

The os externum is surrounded by a spongy structure, subjacent to which is some erectile tissue, except upon the posterior surface of the vagina. At each side of the orifice

are two muscles which originate in front of the rectum, where the fibres of both are interlaced with each other, and also with those of the sphincter ani. These muscles are considered as constrictors of the vagina, and terminate upon the sides of the clitoris, extending partially to its suspensory ligament. The arteries of this canal are derived from the common pudic; the veins are numerous, and join the hypogastric. The nerves come from the hypogastric plexus, and many branches direct from the uterus.

The rugæ of the vagina are not seen until the fifth month of gestation; and in a month or two thereafter, they are much developed.

Sect. VIII.—*Hymen.*

The Valvula vaginæ is a duplicate fold of the fine villous membrane which lines the canal, and is felt rather within its entrance. In every one of a given number of females, the form of the hymen may vary. It is not peculiar to the human species, but is also observed in the lower animals. In the young subject it lies loose, and gradually expands as the capacity of the vagina increases. When present in females who have attained maturity, it may in one case surround one half the circle of the passage; in a second, it may completely surround it, having an aperture in its centre; in a third, it may form a cribriform septum; in a fourth, it may be found in the shape of a strong membranous band, extending from the pubic to the perinæal surface of the canal; and in a fifth, it may completely intercept the vagina, a condition which may remain unknown, until the catamenia are secreted.

By the Jews the hymen is considered as a test of virginity; and they attach strong suspicions of incontinence to those in whom it is wanting. These opinions, however, are without foundation, for in some instances it is so delicate as to be ruptured, simply by preternatural extension or exercise with the limbs; or it may be destroyed by acrid discharges from the passages; while on the other hand it is occasionally so strong as to prevent the consummation of marriage, and in some instances it is wanting even at birth. Its remains after laceration constitute the *caruncula myrtiformis.* This septum is not formed until the fifth month of intra-uterine life.

Sect. IX.—*Rectum.*

As this portion of the bowel is very intimately connected with the vagina, and may be involved when this organ is in-

jured, whether in consequence of the extraction of the fœtus by the feet before the passage is sufficiently dilated, or from want of proper caution in applying forceps, the relation of these canals to each other must therefore be kept in view during delivery. The rectum extends behind the vagina, and rather on the left side than in the immediate centre of the hollow of the sacrum. If it be loaded, as too frequently happens, when labour commences, it may influence the position of the fœtal head, on its entrance into the brim and transit through the pelvis. A presentation of the face to the right is much more frequent than to the left side of the basin, which may be ascribed to the face requiring more room than the occiput, and there being greater accommodation in the right than in the left side, as this last is partly occupied by the rectum.

CHAPTER VII.

MENSTRUATION.

This term is applied to a sanguineous fluid, which is discharged per vaginam periodically, from an early age to the decline of life, in almost every individual who is not pregnant, nursing, or suffering from disease; and is derived from its returns being monthly in most of the sex. To this, like every general definition, there are many exceptions. *First*, Individuals are met with in whom this function has never been performed: the author has been consulted in two cases of this nature,—the one, an unmarried lady, died of hepatitis, when past thirty years of age; and the second is nearly fifty and a widow, but she has neither been indisposed nor conceived. *Secondly*, Daventer relates a case where, instead of the menses, which had never appeared, the patient had a diarrhœa, which, for a long time, showed itself periodically; and the author has repeatedly met with similar examples. *Thirdly*, This effusion does not always present a sanguineous but a leucorrhœal aspect, especially in young persons primarily indisposed; which has given rise to the opinion that in occasional instances females have conceived antecedently to menstruation. *Fourthly*, Instead of a discharge per vaginam, we occasionally meet with examples where this takes place from the other outlets of the body, as the lungs, stomach, hæmorrhoidal vessels, ulcers on the surface of the body, wounds after surgical operations, the breasts, the whole tegumentary

surface of the body, and even the roots of the nails. *Fifthly*, Females not unfrequently menstruate during lactation, which ought then to be discontinued, as the milk is deteriorated, and, according to the experience of the author, may lay the foundation for rachitis or some variety of struma in after life. In the southern parts of Britain and on the continent of Europe, many females are regular while nursing. *Sixthly*, Although at one time it was believed that pregnant women could not menstruate, yet the author presumes that this belief cannot now be entertained except by persons of limited experience. From many observations in his own practice, the author considers this to be as well established as any fact in medicine. It is of the utmost importance to bear this in mind in cases of medico-legal investigation regarding the actual residence of the fœtus in utero in a first gestation, where suspicions might have been entertained of a woman having been pregnant antecedently to marriage. When the catamenia appear during gestation, it is reasonable to infer, that as the os uteri is sealed up, they are afforded by the vagina; which inference is supported by the circumstance of the menses having recurred by the usual channel, on the restoration of health, in females who had been deprived of nearly the whole of the uterus by operation.* *Seventhly*, Although the menses generally cease during formidable chronic diseases, yet in occasional instances, they recur regularly to an advanced stage in phthisis.

The appearance of this function may be accelerated by the influence of warm climate, generous nourishment, free intercourse with the other sex, town life, early introduction into society, personal attractions, and salutary exercise. Menstruation may be retarded by the influence of cold, a limited allowance of food, unwholesome nourishment, latent predispositions to constitutional diseases, as phthisis and the various modifications of struma; also by an undue degree of exercise, a sedentary occupation, and breathing an impure atmosphere.

In temperate climates like that of Britain, the first menstrual eruption appears more frequently in the 14th or 15th year than at any other age; near the equator, from the 8th to the 12th; and in high latitudes, from the 18th to the 22nd year. Professor Osiander of Goettingen, in a record of 137 persons, states that 9 of this number menstruated at the 12th year, 8 at the 13th, 21 at the 14th, 32 at the 15th, 24 at the 16th, 11 at the 17th, 18 at the 18th, from 10 to 20 at the 20th, 1 at 21, and 1 at 24. In a record of 509 cases

* Dublin Hosp. Rep. vol. iii.

preserved by the author at different periods, and in which he endeavoured to observe accuracy, the individuals became indisposed at the following ages: 26 in the 12th year, 30 in the 13th, 146 in the 14th, 145 in the 15th, 102 in the 16th, 36 in the 17th, 30 in the 18th, 10 in the 19th, 8 in the 20th, 4 in the 21st, 2 in the 22nd.

To the foregoing laws, however, there are exceptions in all countries. In the first edition of this work, I stated the particulars of a case in which something like a periodical discharge appeared from birth at intervals of 3 weeks, and continued for 3 years, when it ceased, but re-appeared 6 months subsequently, and in a short time afterwards, the individual died; when, on dissection, her sexual organs appeared unusually developed. The periodical literature of our profession abounds with cases of menstruation at various periods of infancy and childhood. In France, Italy, Spain, and Portugal, the menses appear from the 12th to the 13th year; and in India, Abyssinia, Asiatic and European Turkey, from the 9th to the 11th year. Müller mentions that young Jewesses menstruate earlier than other females of his country.

When females of this country menstruate prematurely, the ailments usually attendant on this change are often severe, and the discharge is not always sanguineous, but leucorrhoeal for the first two or three periods; while, on the other hand, individuals of the same age in southern latitudes neither suffer in their native climate, nor after their removal to a colder clime, so much as young females of colder countries. Except in occasional rare instances, under whatever form the catamenia appear they are preceded, or their recurrence is accompanied, by derangements of various organs. In one case the nervous system may be principally affected, indicated by severe hysterical paroxysms, or languor, headache, peevishness, and great susceptibility to impression; in a second instance, the respiratory organs may be involved, and there may be cough and breathlessness; in a third, the circulating system, and there may be palpitations and acceleration of pulse; the digestive apparatus may suffer in a fourth individual, indicated by gastric irritation, dyspepsia, intestinal intonations, tormina, and diarrhœa; and in a fifth instance, the urinary and reproductive organs may be most affected, and hence frequent and copious micturitions; turgescence of the mammae and external genitals, leucorrhœa, lumbar, pelvic, and femoral uneasiness, with pruritus, rarely venereal orgasm.

The most extraordinary changes, both local and general, are developed after this function is established. The com-

plexion is improved, the body attains its destined degree of perfection, the features receive their stamp of character, the countenance is more expressive and animated, the attitudes are more graceful, the mind is more expanded, hence the conversation becomes more intellectual and insinuating, the powers of observation are improved; in unison with the changes in the vocal organs, the tone of the voice becomes more harmonious; and sexual ideas arise instinctively, which call into operation the creative powers of the imagination, the softer passions progressively assume their wonted sovereignty, the pursuits of youth are relinquished for those which characterize individuals of maturer years, and some diseases, as epilepsy, cease spontaneously, while many others are called into existence.

The local changes are also numerous. The pelvis rapidly attains its standard size, and hence the increased breadth of the lower part of the trunk, and the prominence of the nates and ilia. This impulse also affects the mammæ, the external genitals, and the pelvic organs of reproduction. The breasts become more prominent, plump, and extended; and, on being touched, exhibit an erectile power; the nipple projects, is of a red brown colour, and surrounded by a brownish circle. The mons Veneris is now elevated and extended, and, with the labia pudendi, is covered with hair. The latter organs are in nearer contact, fuller, and more florid. Among these changes the growth of the uterus is not less striking, as it is so rapid; its body becomes more plump, broader, and elongated, which gives the cervix the appearance of having become shorter. The ovaria increase rapidly, become larger, more rounded, oval, and fissured, instead of being elongated, flat, and smooth. The fringes of the Fallopian tubes increase in length. The vagina becomes more vascular, softer, distensible, and capacious.

During the first year after the manifestation of this discharge, it is in many instances irregular in its returns; it may be absent for several months, or even a longer period, and then reappear several times in regular succession. Thereafter, however, in females of correct habits, in the enjoyment of health, whether single or married, its recurrence is so regular, that the great majority of the sex can calculate the very day on which their indisposition may be expected. The most usual period of recurrence is monthly; but in occasional instances this happens every three, five, six, or even eight weeks. In females addicted to libertinage, the abuse of stimuli, or who are a prey to the mental passions, the flow is very irregular in its returns. In such persons it is not

unusual for a sanguineous discharge to appear every fourteen days, continue to flow for one or two days, and then cease for a short period.

After the function has been for a time established, and the discharge is regular in its recurrence, those ailments which accompanied its primary appearance are greatly mitigated, or entirely cease; and many individuals suffer so little that they are not only in a condition to superintend all their domestic duties, but even frequent places of public entertainment during their indispositions, though not always with impunity, since individuals suspect, and not without reason, that corporeal exertion on such occasions has laid the foundation for prolapsus uteri, menorrhagia, leucorrhœa, and protrusions of the vagina.

Frequently, though those derangements so often attendant on menstruation have entirely, and for a very considerable period ceased, yet, from a variety of causes, such as a sedentary occupation, frequent mental irritation, or undue indulgence in hymeneal pleasures, some of them return under a most aggravated form, more especially the cephalalgia, gastric irritation, and pelvic uneasiness, all of which are so violent as to compel the sufferer to remain in bed for days in succession. In some instances the menstrual period is attended with paroxysms of hysteria, of so severe a nature as to be accompanied by temporary mental derangement. In almost every case in which the function is performed with so much suffering, the flow is very sparing. Sometimes, during the presence of indisposition, more especially in females of sensitive olfactory organs, the sense of smell would appear to be morbidly excited, since they perceive an effluvium emanating from their own persons, though nothing offensive be felt by those around them.

The duration of each period in high latitudes, in some parts of which the function shows itself during the warmer months, three or four times only during the year, does not exceed some hours; in temperate climates, it continues from three to five or six days; under the tropics, from six to eight days, or even longer. In Lapland and other polar regions there is seldom any regular flow, the clothes are merely stained with a scanty sanguineous exhalation; in a climate like ours the flow, in a state of health, rarely exceeds three or four ounces, which, during the first twenty-four hours, is elaborated in very small quantity, very freely during the second and a part of the third day, and thereafter it quickly ceases. During the first periods, generally, the flow is more or less sparing in every female. In the residents of warm

countries, not only is the duration of each period protracted, but the quantity greatly exceeds what is elaborated by individuals of colder climes, so that to the former these monthly pollutions are a source of great inconvenience. Hippocrates estimated the quantity of each period, in females in the Archipelago, at twenty ounces of our measure; according to Galen, 18 ounces; Haller from 6 to 12. It is stated that in Java, women often die from excessive menstruation. The quantity is not only regulated by climate, but also by an infinite number of other circumstances, as temperament, diet, and occupation. The plethoric, such as indulge in luxuries, and those who are occupied in a warm atmosphere, are well known to menstruate profusely.

The *final cessation* of this function, like its primary appearance, varies in different climates, and is attended by numerous changes, and derangements of many functions. In a climate like that of Britain, it continues, except in some very rare instances, until between the 45th and 50th years; but I have known it cease in one instance at 32, and in another at 36; while, on the other hand, individuals have been met with who continued regular to the age of 55 or 60, as has been stated by Haller, Desormeaux, and others. In meridional and polar regions, again, the menses cease between the 30th and 40th year; in Abyssinia, so early as 18 years, in many instances. The period of cessation is styled by the sex themselves critical, upon the supposition that the mortality is greater among them at this, than either at an earlier or later period of life; but this opinion is satisfactorily contradicted by authorities on statistics, as Finlayson, Moret, Chateauneuf, Lachaise; while it may be proved by individuals extensively engaged in female practice, that women are not more subject to disease at this than at any other epoch.

When the function is about to take its final leave, its returns become irregular, it may be absent for one or more periods, thereafter returning profusely, containing coagula, preceded and followed by leucorrhœal discharges. These irregularities may continue for one or more years before the discharge finally ceases; after which diseases certainly threaten to which there was at one period a tendency, such as a numerous train of nervous disorders, the most distressing headaches, vertigo, tinnitus aurium, with impending attacks of apoplexy, temporary fits of insanity, phthisis, palpitations, faintings, dyspepsia, hepatic, splenic, pancreatic, and ovarian engorgements, numerous diseases of the uterus, and of the urinary organs.

In connection with this change, the countenance progressively becomes sallow, the skin flabby and corrugated, the mammæ atrophied, as well as the external genitals, which also become flaccid, corrugated, and lose their bright turgid appearance. The uterus, as well as the ovaries, when unaffected by disease, diminish in volume; and the mucous membrane of the former is relaxed. From this general dilapidation the vagina and rectum do not escape, and hence prolapsus uteri, leucorrhœa, hæmorrhoids, and protrusion of either canal, in advanced life. Occasionally, where this function has ceased somewhat prematurely, a discharge of the same aspect has appeared per vaginam after the lapse of one or more years. This circumstance which, in females who wish themselves to be thought younger than what they really are—a foible excusable in the sex, more especially those who have not relinquished the endearing hope of a matrimonial alliance—requires delicate and prudent management; for however pleasing the information might be to the class just referred to, that they were about to be renovated in their old days, it would not by any means comport with the gravity of females of good sense.

The peculiarities of the menstrual fluid ought to be familiar to the practitioner, to prevent his confounding it with sanguineous effusions, arising either from disease, or the premature separation of the ovum from the uterus. In colour, the menses are of an intermediate shade between arterial and venous blood, darker than the former, but brighter than the latter. When healthy it does not coagulate, however copious the quantity collected, which in some has been very considerable. On two occasions, in consequence of the vagina being intercepted by a preternatural membrane, and the accumulation of the catamenia in this canal, the septum was punctured, when, in both instances, upwards of 20 oz. of this fluid were collected, but it afforded no evidence of coagulation, either at the time or afterwards, nor did it emit an offensive odour. In matrons who have had several children, and who, during the catamenia, are exposed to either local or general excitement, trifling coagula may appear in the discharge. Except when the individual is negligent in point of personal comforts, the odour emanating from this fluid is not unpleasant. I knew an instance, however, where, although the individual was known to be scrupulously attentive, the effluvium was so offensive, that she was obliged, on those occasions, to absent herself from the family circle. It possesses little or no fibrine; and when I compared it under the microscope with blood

deprived of its fibrine, they exhibited the most perfect resemblance.

In conversing with the sex on this delicate subject, the expressions ought to be select, that we may avoid giving offence. The reluctance, in all ranks of life, with which females reply to our inquiries regarding the catamenia, will teach the necessity of caution. There is a phraseology peculiar to the sex of every country, when the menses are the subject of conversation; but in this kingdom, at least, when we wish to ascertain when the catamenia were last seen, or are expected, our object is at once understood by asking the patient when she was last unwell, poorly, or indisposed, or when she expects to be in her terms.

A practitioner of experience and observation is at once made aware of the condition of the patient when she is menstruating, without the necessity of inquiry. There is a pallid appearance of countenance, unusual languor, peevishness, disinclination to exertion, the absence in those of a lively disposition of their characteristic cheerfulness, contracted features, the eyes are encircled by a purple ring, and the orbits surrounded, in occasional instances, by a puffy swelling, most manifest in the morning. All active medicinal agents, as well as surgical operations, except under urgent circumstances, should be avoided when the catamenia are either approaching or present; sexual congress, all active exercise, the mental passions, and exposure to cold, must likewise be guarded against. Exposure to cold, and to the influence of the mental passions, have often, in young females, in whom the menses have only recently appeared, led to the suspension of the function, and distressing results.

Many females while in this condition will not engage in some of their domestic avocations, believing that the menses possess some deleterious influence sufficient to mar their operations. This prejudice is as ancient as the time of Pliny, by whom, with Columella, Bonaciole, and the Arabians, we are informed that the miasm emanating from a woman during menstruation is capable of decomposing milk and other fluids. Albertus Magnus carried this prejudice still farther, by asserting, that females while menstruating were poisonous, intoxicated animals by looking at them, killed children in the cradle, spotted a clean glass, and communicated lepra and cancer to whomsoever had congress with them. These fancies are too wild to deserve the trouble of refutation.

The *source* of the catamenia has long ceased to be doubtful. Galen supposed that the discharge was furnished by

the uterus; and this opinion, variously modified, has been advanced by many writers since his time; while Columbo and others supposed that it was furnished by the vagina; both of which sentiments, from what was formerly stated, must occasionally be correct. Vesalius ascribed it to the uterine veins, Ruysch the arteries, Winslow and Meibomius the arterial capillaries, Lister the glands, Simson particular small receptacles, and Austruc the venous sinuses. There can be but few of the profession who have not had opportunities of satisfying themselves of the exact source of this fluid, which, in cases of prolapsus uteri, may be seen proceeding *guttatim* from the cavity of this organ; and as it differs in several respects from blood, it is probable the glands, as well as the capillaries, may be concerned in its elaboration.

The explanations which have been advanced to account for its appearance are numerous. *First*, Aristotle ascribed it to the influence of the moon on the female economy. If this planet possessed the alleged effect, it may be presumed, that its influence would be most active when in the plenitude of its power, and that all over the habitable portion of the globe the sex would menstruate only at full moon; but in opposition to this absurd notion, it is well known that multitudes of women do not always menstruate precisely on the same hour or day of each month; and that in a large city there must be thousands indisposed daily.

Secondly, By another class of philosophers, the menses have been considered as the result of general plethora—an effort of nature to throw off the superfluous portion of the circulation. As, however, robust females are as often obstructed as those who are spare and delicate, and as the appearance of the discharge cannot be prevented by an antiphlogistic regimen, aperients, and venesection, the foregoing hypothesis is untenable.

Thirdly, The appearance of this function has been explained upon the principle of local plethora; but, besides the want of resemblance to blood, it is liable to the same objections as the second hypothesis. That we have satisfactory evidence of the presence of plethora when this function is impending, such as lumbar, sacral, pelvic, and femoral uneasiness, with engorgement of the external genitals, and a mucous exhalation from these organs, cannot be denied. The same law holds good in the animal economy generally, viz. that when an organ is about to be called into action for the performance of its functions, it receives an increased afflux of fluids; and as a very apposite illustration, we need merely refer to

the condition of the mammæ when the secretion of milk is about to be performed.

Fourthly, Some people, reasoning from analogy, observing that the female of some of the lower animals was in heat, as it is familiarly styled, when she requires the caresses of the male, alleged upon this principle, that the catamenia in the female of our race, were to be considered as the result of a venereal orgasm. It may be urged against this hypothesis, 1st, That in nymphomania, in which, as the term implies, there is an uncontrollable desire for venereal enjoyment, the catamenia are either elaborated in small quantities, or altogether suppressed; and, 2dly, That the female of our race, so far from experiencing the least inclination for sexual congress during the presence of the menses, entertains, on the contrary, the greatest horror at the mere thought of the act.

Fifthly, Somewhat recently it has been advanced, that the catamenia are the result of uterine stimulation, arising from the descent of Graafian vesicles. In opposition to this fanciful hypothesis, it may be objected, 1st, That according to our present physiological knowledge, Graafian vesicles or their contents, may be carried into the uterus, after the passions have at any time been excited, while in females who are healthy, and of regular habits, the catamenia are periodical; 2dly, That in prostitutes, in whom from frequent sexual intercourse the Graafian vesicles would be exhausted in a very short space of time, the menses continue to flow for as long a period as in chaste females; and, 3dly, That in matrons of regular habits, this function continues to recur regularly for years after they have ceased to be productive, and after the Graafian vesicles have been perhaps exhausted.

Sixthly, By Haller, Bourdeu, Hunter, and many other subsequent authorities, this fluid has been considered as a secretion, which opinion is more in accordance with observation than any of the foregoing hypotheses. From what has been stated in the preceding part of this chapter, it is obvious that this function is regulated by the same laws which influence other secretions, by being diminished or increased in quantity, according as the subject may be placed in a cold or warm atmosphere.

The *utility* of this function seems pretty generally agreed upon. At one time the flow was considered as a depurative process, by which some noxious principle was removed from the system, as well as the superfluous portion of the circulating mass not required in the absence of pregnancy and lactation; and, *secondly*, That it was a secretion intended to exert some beneficial influence on the organs of reproduction, to

prepare them for the performance of their important function. The *former opinion* is quite untenable, 1st, Because many matrons, as must be familiar to practitioners, conceive repeatedly without their catamenia having recurred betwixt their several impregnations; and, 2dly, Because frequently also, females are impregnated after having been many months obstructed, thus showing the inutility of a depurative process. The *second opinion* seems well founded; 1st, Because women rarely if ever conceive previously to the establishment of menstruation; and, 2dly, That those who suffer from the various menstrual derangements, such as paucity, profusion, irregularity of recurrence, and suppression, are very generally barren.

CHAPTER VIII.

VIOLATION.

Rape is the carnal knowledge of a female by a male forcibly and in opposition to her will, or unknown to her, during intoxication, sleep, or syncope; or at so early an age that she cannot be aware of the impropriety of it.* The rigour with which those guilty of this crime have been punished in every country, and in all ages, is a proof of the general and just indignation with which it is viewed. Death, castration, loss of eyes, excision of the penis, and imprisonment for life, are the various punishments which were, and still are in different countries inflicted for this detestable offence.† The investigation of this subject must be attended with the utmost anxiety to the medical jurist, since there is none which furnishes more uncertain data for his proceedings, and since his evidence must influence the decision of the

* This crime, when committed on females imbecile in mind, and on prostitutes, is punished with the same rigour as in those of sound intellect, and strict chastity; for the former, whatever their age, may be incapable of judging of the morality of their actions; and the latter may have become sensible of their iniquitous career and repented; but in them the strongest evidence must always be required.

† The Jewish law punished with death, Deut. xx. 25. The crime, by the Roman law, was punished with death and confiscation of property, if committed on a chaste woman, but it took no cognizance of the complaints of a prostitute, Gibbon, ii. p. 252. In China, rape is punished with death, Ed. Rev. v. xvi. p. 498. In the state of Missouri, America, the punishment directed by law for rape, is castration by a skilful surgeon. In the state of Virginia, the crime, when committed by blacks on white women, is similarly punished as in Missouri. By the ancient Welch laws the offender was required to make a present in specie to the sovereign, or, if unable, *virilia membra amittere*. In the time of William the Conqueror, castration and loss of eyes were inflicted.

judge, and determine the fate of the accused. Moreover, our difficulties are not a little increased by the latitude which is granted to the injured party, whose testimony is alone sufficient to condemn the criminal.

In all contested cases, not only the parts of the female, but those also of the male, should be examined as early as possible; since all evidence of injury, unless severe, may disappear within a short period after it has been inflicted. The importance of this direction has been so well appreciated from a remote period, that in Scotland a law has long existed, which requires that complaint be made within twenty-four hours. When this regulation has not been complied with, it should, in most circumstances, be deemed favourable to the accused. But we may certainly suppose a case, where a female, situated in a sequestered part, may have been so much injured as to be incapable of giving information within the specified time. The practitioner should carefully collect all information calculated to elicit the truth; and in his report be chiefly guided, *first*, By the situation in which the woman was placed when the crime was committed; *secondly*, The age of each party; *thirdly*, Their respective strength; *fourthly*, The condition of their respective organs; *fifthly*, The auxiliary means, if any, employed; and, *sixthly*, The marks of violence upon the person of the female. When an opportunity is afforded of seeing the individual very soon after the crime has been committed, it will also be of consequence to notice the condition of her dress, whether it is much disturbed or torn, thereby affording evidence of resistance on her part. It is likewise proper to determine the duration of acquaintance and extent of intimacy of the party. If the acquaintance has neither been long nor intimate, there is less reason to apprehend that the accused had received any encouragement, and *vice versa*.

If it can be proved that a female, when violated, was so situated that she could not make herself heard, such a circumstance should be allowed to have its due weight in her favour; while, on the other hand, if it should appear that she had not called assistance, though in a situation where she could easily have done so, such a discovery ought certainly to weaken her testimony. The importance of attending to the situation of the woman when the crime was committed, was observed as early as the time of the Jewish Legislator.*

In regard to age, a male under fourteen years, is consider-

* "But unto the damsel thou shalt do nothing, for he found her in the field, and she cried, but there was none to save her," Deut. xxii.

ed by law, in consequence of imbecility both of mind and body, incapable of committing a rape.* Except where an attempt has been made to violate young females under the age of puberty, or those come to maturity, during inebriety, syncope, extreme debility, or sleep, all accusations against decrepid, sickly males, and such as are past sixty years, should be received with much caution, or at once discarded. Rape has rarely been consummated in a female before the age of puberty, as a male organ of the ordinary volume cannot be forced into the vagina without occasioning excessive suffering, from the very contracted state of the canal at this period. Even in our possessions of the eastern and western hemispheres, where the sex arrive much earlier at puberty than in this climate, and where the execrable practice prevails, when they have attained maturity, of disposing of their virginity to European merchants and officers, the sufferings during the first intercourse, though there is the most pliant submission on the part of the victim, are so excruciating, that frequently a perfect coition is not accomplished until after several attempts.

As to the strength of each party, it is of the first consequence that this should be carefully considered. I unhesitatingly add my testimony in support of those who are of opinion, that very rarely *can a single man accomplish this crime in a woman of ordinary strength, come to the age of maturity, and in the full possession of all her faculties.* This doctrine was strongly insisted on at the trial of William M'Kenzie, (Edinburgh 1828,) when one of the judges on the bench stated, that on a trial in Stirling, in 1811, the woman was seen, by persons at a distance looking through a telescope, to have been overcome by one man, alone and unassisted, and the extreme sentence of the law was inflicted on the criminal.† The sentiments of medical men who have maturely reflected on this subject, are decisive. Mahon observes, "en un mot, d'après la connoissance physique que les médecins ont de l'homme et de la femme, on doit rarement ajouter foi á l'existence du viol; je crois même qu'il seroit prudent de ne l'admettre que lorsque plusieurs hommes armés se sont réunis pour commettre ce crime." Similar sentiments are entertained by Farr and M. Foderè. The former

* In a general sense this law may apply in temperate countries; but in warmer climates, there is reason to believe, that in males, as well as in females, puberty takes place at an earlier age than fourteen years. Sacred history informs us that Ahaz begat Ezekias, at ten; and that at eleven years, Solomon begat Rehoboam, 1 and 2 Chron.

† Syme's Justiciary Reports, p. 332.

says, that with force the crime is possible, but that a female always possesses sufficient power by drawing back her limbs, and the force of her hands, to prevent penetration, whilst she can preserve her resolution. M. Foderè states, "elle a infiniment plus de moyens pour se defendre que l'homme n'en a pour attaquer, ne fut-ce que le mouvement continuel."* Metzer only admits of three cases in which the crime can be consummated; *first*, Where narcotics have been exhibited in such quantity as to obtund the senses and induce profound sleep; *secondly*, Where many persons are engaged against the female; and, *thirdly*, Where a strong man attacks a female who is not arrived at the age of puberty. La Motte and Mayard both mention cases which prove how necessary it is to form a proper estimate of the power of each party. The former relates an instance, where an officer, aided by five of his companions, failed in their attempt to violate the chamber-maid of an hotel.† She effectually resisted their united efforts for a long time, and must at last of necessity have yielded, but for the accidental appearance of her mistress. In Mayard's case, a young man, who was accused of having committed a rape, was sentenced to pay the injured party, in the presence of the judges, a sum of money as an indemnification for the insult; but immediately thereafter, he was allowed to exert his whole power to recover the sum, which, however, he found impossible; wherefore the judges concluded, that it was equally in the power of the female to have resisted the embraces of the accused altogether; and he was forthwith acquitted, and his fine remitted.‡

In regard to the appearance of the male genitals, under particular circumstances, their early examination may lead to very important disclosures. If, for example, a male of exuberant organs has long persisted in accomplishing penetration in a very young female who is averse to the intercourse, the frœnum might be lacerated, the prepuce swelled, and the organ in general tumefied and scratched. Abrasion on the penis should always be viewed in a favourable light for the female, as constituting good evidence of her having resisted penetration. Diminished size of the penis cannot absolve the accused, though the opposite opinion was at one time entertained. The mutilation of this organ, however,

* Pour les filles artificieuses, a dit M. de Voltaire, qui se plaindroient d'avoir été violées, il n'y auroit, ce me semble, qu'à leur conter comment une reine cluda autrefois l'accusation d'une plaignante: elle prit un foureau d'épée, et le remnant toujours, elle fit voir à la dame qu'il n'étoit pass possible de mettre l'épée dans le fourreau.—Foderè v. iv. p. 359.

† La Motte, vol. ii. p. 1364.

‡ Gardien, vol. i. p. 106.

and the absence of the testes,* may be viewed as causes of incapacity on the part of the male; but we are not to pronounce the individual destitute of the latter organs, though they are not in the scrotum, since there are cases where they have never descended from the abdomen. If the male is known to have erections, and desire for copulation, the presence of the testes can no longer be questioned. As to the condition of the female organs, there is nothing more undecisive. More than a thousand opportunities in Cyprians, and very many examinations in females of chastity, enable the author to corroborate the observations of Duchatelet, that, with the exception of relaxation of the vagina, there is, generally speaking, no difference in appearance between the external organs of these two classes. Nor would it be a correct inference, though the opinion is held by some of our members, that females with a large clitoris, or an exuberance of the other external genitals, are of a more amorous disposition, than those women in whom these parts are of the usual formation. In proceeding to their examination, however, the practitioner should mark whether permission is granted with reluctance, or without hesitation; as from this we may learn whether the individual be a novice or not. Although such evidences of injury are to be observed on the external parts, as to excite suspicions of the crime having been attempted, or actually committed, it ought to be remembered that all this may have been brought about by the individual herself, to be revenged on some one by whom she may have been slighted. I was once called in a case where an artful concubine accused a student of medicine of having violated her. The woman was in bed, apparently labouring under considerable bodily and mental excitement; on examining the parts, they were imbued with a sanguineous fluid, and two small coagula were removed from the vagina. Appearances were suspicious; but I discovered on the mantel piece a thick stocking wire, covered with blood in a dried state, which, with the character of the woman, disclosed to me the real nature of this pretended rape. I left her, threatening to expose her conduct, and heard no more of the case, which, as I learned afterwards, had been got up to extort money from the accused, whom she had occasionally

* Venereal desires have been known to subsist in considerable force, and with the usual external signs in eunuchs. They also emit, but cannot fœcundate; for as there are no testes, the discharge must be derived from the vesiculæ seminales and prostate. From the experiments and observations of our most accurate physiologists, it would seem that the fluid ejaculated during copulation contains but a limited portion of semen.—Paris and Fontblanque, Art. *Rape*.

permitted to perform some kind offices for her. Had it not been for the discovery of the wire, I might have given a decision unfavourable to the accused. When the parts, therefore, exhibit evidences of injury, the medical jurist must be careful not to attach too much importance to such appearances, unless supported by additional and more powerful proofs. When there is a sanguineous discharge from the vagina, we must carefully distinguish whether it be the menstrual secretion or not. The latter may be known by its forming no coagula; and particularly, by a purple areola surrounding the eyes, which is observed when menstruation is present, and not produced by any other cause. Artful females have often taken advantage of the presence of the catamenia, to prefer an accusation against a paramour who may have neglected or treated them with indifference. Every systematic work on state medicine abounds with examples of false accusation. Sacchias relates a case where the accused had been incarcerated for having violated a supposed virgin, but no complaint had been preferred against him for four months, when Sacchias was consulted, and found him with a very small mutilated penis, which induced him to conclude that he could not have committed a rape. The virgin had been examined by a midwife, who declared that she had been violated; but Sacchias reversed her decision, for he found the vagina too capacious for a virgin; and, moreover, inundated with leucorrhœa. The accused was immediately liberated. In a second case, by the same author, the accused was also incarcerated, and three midwives ordered to report on the virgin whom he had violated. Two of them thought the crime had been perpetrated, but the third saw no ground for such a conclusion, whereupon the case was submitted to the judgment of Sacchias and another experienced physician. They both agreed with the third midwife; principally, because the accusation was not preferred for twenty-one days after the crime was said to have been committed, which rendered every examination useless.* Foderè relates the case of a girl between eleven and twelve years of age, who brought an accusation of rape against a man of fifty, tall in stature. On investigation, the crime was said to have been committed fifteen days previously; and although she had not commenced to menstruate, yet the finger could easily be introduced into the vagina, and the hymen was found ruptured; and the pretended virgin was ascertained to be labouring

* Sacchias, Edit. v. p. 730—44. Foderè, v. iv. p. 367.

under a gonorrhœa. Foderè concludes that the disease was a proof of connection, but not of rape; as her conduct when examined was destitute of modesty, and because she had not complained till after symptoms of syphilis had appeared. The accused was acquitted.

The crime may be committed without the least injury to the external genitals, especially if the woman has previously had frequent sexual intercourse, or if she has given birth to one or more children. These are the individuals in whom an early examination of the parts is of the highest importance; since, if a few hours only have been suffered to elapse before the inspection, all evidences of injury, as trifling bruises or effusion, may have disappeared. When purple or yellow patches are observed on the thighs or on the lower parts of the abdomen, they may be viewed as the result of severe bruises, and as affording support to the accusations of the female. An early examination may detect tumefaction of the clitoris, and of the labia majora and minora. But I protest against laceration of the fourchette, either in young or old females, except under the greatest exuberance of the male organ; and this extravagant diagnostic is insisted on only by persons who must have forgotten, or never could have possessed a proper knowledge of the structure of the parts. I certainly was once consulted in the case of a married lady, who had inflammation of the lining membrane of the vagina in a day or two after the union, the effect of mechanical distension.

Though I firmly believe that none but a male of great power could effect his purpose on a woman come to maturity, yet there cannot be a doubt that the attempt by a man of moderate strength might be successful in a young female under the age of fifteen; in whom, as she is less capable of resistance, and not so sensible of the magnitude of the injury she is about to suffer, it is very properly punished with the same severity.*

* If the child be under ten years of age, it is felony by the statute; but if she be above ten, but under twelve, then it is no rape if she consented, but only a misdemeanour. It has been determined by law, that an infant under twelve, under seven even, when she has sense and understanding to know the nature and obligations of an oath, may be a competent witness; that no hearsay evidence can be given of the declarations of a child, who hath not capacity to be sworn; that such child cannot be examined in court without oath; and that there can be no determinate age at which the oath of a child ought either to be admitted or rejected; but their admissibility depends upon the sense and reason they entertain of the danger and impiety of a falsehood, which is to be collected from their answers to questions propounded to them by the court; but if they are found incompetent, their testimony cannot be received.—East Crown Law from Beck, p. 62—2. Arrêt du parlement de Grenoble, qui condamne un prêtre d'etre pendu, puis brulé, pour avoir abusé du sacrament de confes-

When the crime is perpetrated in young persons of this age, or in females arrived at maturity even, but who have never before suffered sexual communication, it is more easily detected than in women who are in constant intercourse with their husbands, or those who have borne children. The first attempt in a young person, even with consent, is always attended with some injury to the parts; and when persisted in by an adult vigorous male, in opposition to her will, the organs, on an early inspection, will exhibit such evidences of violence, as cannot fail to prove the fact of connection. There may be tumefaction of the external genitals, and effusion of blood from the vagina; but whether there be any discharge of this nature or not, the patient will be sensible, after the conclusion of the intercourse, of an unusual moisture, or flow from the parts. In a very young female, if the membrum virile be exuberant, it is possible, but barely possible, that the frœnum labiorum may be slightly injured.

It is of importance to remember, that appearances very similar to those just described, have arisen from disease, and led to the most painful suspicions against individuals in every respect innocent. Dr Percival details a case of this nature, which had nearly been followed by melancholy consequences. In February 11, 1791, Jane Hampson, aged 4, was put on the list of out patients for the Manchester Infirmary. The external genitals were highly inflamed and painful, although she had been in her usual health until the preceding day, when she complained of pain in voiding urine. She had slept in the same bed for two or three nights, with a boy fourteen years old, by whom according to account, she had been much hurt during the night. Leeches, and other appropriate external and internal remedies were used; but the debility increased, and she sank on the 20th of the same month. The body was examined and the thoracic and abdominal viscera found healthy. A coroner's inquest was held, at which the attending surgeon declared as his opinion, that the death of the child had been caused by external violence; whereupon a verdict of murder was returned against the boy with whom she had slept. The occurrence, however, in a few days afterwards, of several cases of a similar

sion, porté ses mains sur le sein et autres parties de plus de cent femmes, pendant qu'il confessoit. In France, the crime is visited with additional severity, when committed by persons in trust, as clergymen; but by the code Napoleon, the punishment was mitigated from death, to hard labour, and imprisonment for a limited period, or for life. Foderè, vol. iv. p. 329. In 1777, the Rev. Beng. Russen, a puritanical schoolmaster, was convicted and executed for committing a rape on a girl under ten years of age.—Paris and Fontblanque.

character, in which some of the young patients died,* and in which there was no reason to suspect any external violence, induced the medical attendant to retract his declaration, and the coroner to reverse his decision, and the boy was acquitted. Though of very rare occurrence, this affection should suggest great caution in medico-legal investigations and decisions. The antecedent fever, and the dark tint of the inflamed labium, as particularised by Mr Kinder Wood, are important diagnostics.†

In these investigations, much stress has been laid by medico-legal inquirers of every age, on the condition of the hymen and vagina; but in young females, who are the most likely to possess the former, the external appearances of injury are certainly far more to be relied on than any state of the passage or its septum. To show how little either its presence or absence ought to influence the report of the medical jurist, it is not always found in new born infants,‡ which will account for some of the profession having denied its total existence; while in other instances, it has been found at the time of delivery so perfect and strong, as to require an operation before that process could be completed.§ The hymen is sometimes so delicate that it is ruptured by the rude treatment of an unskilful nurse during the first ablutions of the infant;‖ it may be destroyed by acrimonious discharges from the vagina; by too great an extension of the limbs in dancing or jumping;¶ and it is occasionally so extremely delicate that it may be torn during an examination to determine its presence, unless this be tenderly conducted. The hymen in some instances occupies so small a portion of the vagina, that a woman may be violated without any injury to this membrane, *i. e.* where there is a large perforation in its centre,** or it is confined to one side of the canal. In the case of a young married lady whom I attended in labour, the hymen

* Dr Percival, Med. Ethics. p. 163—231.

† Med.-Chir. Trans. Lond. vol. vii. p. 94. M. Cauperson also met with two similar examples, the one in a child of four, the other in a child of six years old. P. 41, 42.

‡ J'ai vu plusieurs pucelles et enfans abortifs qui n'avoient point de hymen. Andrè, Mahon, v. i. p. 117. I could never find it in any,—seeking in all ages from 3 to 12, of all that I had under my hands in the hospital at Paris. Parè, p. 937.

§ Ruysch Obser. 21. p. 21. vol. 2.

‖ L'hymen est detruit par l'imprudence des nourrices, qui deflores souvent les petites filles dès leur naissance, en frottant trop fort les parties genitales pour les nettoyer. Maygrier, vol. i. p. 42.

¶ Si cette membrane est mince, fine, et large, quelques mouvemens brusques ou etendus des membres peuvent la faire disparaître. Velpeau, vol. i. p. 63.

** Si enim, cum virga virilis tenuis est, et orificium hymenis amplicusculum, absque hymenis dilaceratione virgo corrumpi potest. Sacchias, Edit. v. p. 731.

was entire when the parietal protuberances entered the brim of the pelvis. In other instances it has been found necessary, in consequence of its rigidity and thickness, to have it divided, to admit of the consummation of marriage;* and where a female might have been violated without our being able to elicit the necessary information from the state of the hymen. Cases are met with where a preternatural septum is found within the hymen,† and where, after the latter has been destroyed, unaccompanied by an external injury, it would be impossible to learn by any examination whether the individual had been violated or not; or where, indeed, by confounding the preternatural boundary with the true hymen, we might be disposed to think the crime consisted in a mere attempt, and the accusation unfounded, while perfect coition might in fact have been performed.

We can never determine from any condition of the vagina whether an individual may have been violated or not, unless she is examined immediately after the act, which is not likely often to happen. This canal, as it has no function to perform previous to sexual communication, except to give exit to the catamenia, is rigid and very contracted. If, therefore, it be found much dilated, and very dilatable, in an unmarried female, the impression on my mind would be, either that she was not a novice, or that she had been indulging in an abominable practice not necessary to be named, and that her testimony should be received with great caution. For although the canal is not endowed with a large share of contractile power, yet where it has not been frequently dilated, it will very shortly be restored to its original state; and nothing but frequent distension will cause a permanent dilation of it. It is also said that the rugæ of the vagina are removed by frequent sexual intercourse, and by one or two deliveries, destroyed.‡ There is nothing more unfounded than this assertion. The rugæ, by frequent connection, certainly become less distinct at the upper part of the canal; but even in females who have had a numerous family, they are not wholly destroyed.

Certain conditions of the carunculæ myrtiformes have also been specified, with a view to guide the medico-legal inquirer; and in these, some writers on this subject seem to place a considerable degree of confidence. In virgins these bodies are said to be large, almost in contact, and of a

* Parè, loc. cit. Cases of this kind are related by almost every writer on midwifery.

† Ruysch, loc. cit. Edin. Jour. Med. Sci. No. II. p. 339. ‡ Beck, p. 53.

bright red colour; while in persons who have had frequent connection, they are described as being small, shrunk, flaccid, distant from one another, and in colour pale, approaching to a bluish tint.* To what degree of importance these refined remarks are entitled, I am unable to determine, since those females of this country from whom such information could be most correctly acquired, fortunately do not possess the necessary complaisance to submit to an investigation. In our examination of the sufferer we must recollect that it is not the question of virginity or non-virginity which we are called upon to consider, but we are required to determine two distinct points; *first*, Whether connection has recently been effected; and, *secondly*, Whether or not that connection was forcible, and against the will of the female. The appearance of the genital organs, as already described, merely proves that sexual intercourse has taken place, perhaps for the first time; but this is not sufficient to constitute rape; further evidence must therefore be adduced to show that the connection was resisted. The best proof of opposition on the part of the female is the presence of contusions or ecchymoses, as if her arms had been firmly grasped by a powerful hand, or her thighs bruised by the pressure of the knees of her ravisher: this forms the proof of violence, which, together with the indications of recent sexual intercourse, constitutes a charge of forcible connection, or rape. We must, therefore, carefully examine the whole person, in order to discover any marks of violence, and at the same time we must not neglect to examine the clothes which the female wore at the time of the alleged rape, as they may be stained with blood or seminal fluid. The former of these may be known by its own characteristic tests, which it would be out of place to detail here. As to seminal stains, long chemical analyses have been prescribed for their detection; but these may be readily dispensed with, as all that is necessary is merely to moisten the spot with a little distilled water, and place a drop under the microscope, when the debris of the spermatic animalcules will be at once detected. The presence of these spots, or the discovery of the spermatozoa in the vaginal mucus, will afford a strong presumption that the alleged rape has not been effected with a stocking wire, or any such inanimate body.

Auxiliary means are occasionally employed by the unprincipled of our sex, to enable them to perpetrate this odious crime, such as the assistance of other persons of their own

* Sacchias, p. 255. Foderè, vol. iv. p. 351.

stamp, the exhibition of ardent spirits to produce intoxication, and of some narcotic, opium or its preparations, to obtund the senses and induce profound sleep.* Cases in which it can be proved that additional force has been employed, rarely require the assistance of the medical jurist, for they are most generally proved by positive evidence. Females have certainly been violated under the latter circumstances* and such cases, as well also as those where the sex have been outraged during syncope, or any other state of inability, are very properly considered rape; and the accessaries, as well as the principals, are justly subject to capital punishment. The possibility of a female being outraged unknown to her during sleep has been questioned. Though in the case of young virgins, I think the pert sentiments of Valentinus, *non omnes dormiunt, qui clausos et conniventes habent oculos*, very applicable; yet there cannot be a doubt that the crime may be committed on women accustomed to sexual intercourse, since some matrons have been known to bear children in a state of natural sleep, without being conscious of it.† In a young female who has never before suffered the embraces of a male, the act, though perpetrated even during a state of insensibility, may, if the case be investigated soon afterwards, very possibly be proved by the injury which had been done to the parts; but in a woman who has been in constant intercourse with a male, or has had children, it will be difficult to prove the commission of the crime. In these instances, our conclusions must be deduced from the symptoms which have been developed by the exhibition of the narcotic or other agent; from pregnancy when it supervenes, corresponding to this particular time; and from the injury, if any, that has been done to the parts.

Some diversity of opinion did exist as to what should be considered rape; whether the intrusion of the *membrum virile* simply, or both intrusion and seminal emission. In this country both were deemed indispensable to constitute the crime; but it became at length notorious that many individuals evidently guilty of rape were acquitted, owing to the difficulty felt by the female in swearing to emission. For married women, in many instances, will acknowledge that they are not sensible of it;‡ and if this confession be made by females, from what they experience in deliberate intercourse with their husbands, it is still less probable that any

* See Chap. on Conception in this work.

† See Chap. on Infanticide in this work.

‡ It is well known that many women *amore consuetæ* are insensible of it even when the coitus is complete. Mall. p. 167.

sensation of the kind can be perceived by individuals during, probably, the highest degree of mental excitement, and the most violent struggles to escape from an act which, in an uncontaminated mind, must inspire a greater degree of horror than death itself. Where a woman swore positively to emission, my impression would be, not that the case was one of rape, but of consent and malice. In order to remedy this difficulty, it was enacted by the Lansdowne Act, 10 Geo. IV., c. 34, "That it shall not be necessary to prove the actual emission of seed in order to prove carnal knowledge, but that carnal knowledge shall be deemed complete on proof of penetration only." Such a change in the law was long wanted, and will appear perfectly just, when we consider that it is not the mere penetration or emission which constitutes the enormity of the crime of rape, but the outrage offered to morality, female modesty, and social order.

It may be asked, whether pregnancy ever succeeds rape? This question was at one period very generally answered in the negative. It seems most consistent, however, in the present state of our knowledge, to adopt the opposite opinion; for, though the uterine functions are to a certain extent under the influence of the mind, yet we have no reason to suppose that they are subject to any such power at the time of conception, as the individual is fœcundated whether she be inclined for or against it; and also, while she is in a state of insensibility.* But impregnation is not an invariable result, for the experiment, though a dangerous one, was fairly tried not twenty years ago in this city, on a young virgin of respectable birth; who, instead of being conducted to a boarding-school, was taken to a bagnio, when so large a proportion of the Tinct. Opii had been infused into her coffee, that her *protector* was enabled to accomplish his diabolical purpose, without her being aware of it until she discovered him in the same bed with her, when she awoke in the morning. The experiment ultimately proved a most expensive one!

In conducting investigations of this character, we sometimes find the female affected with syphilis; and the question very naturally suggests itself, whether she had contracted the disease from her ravisher, or antecedently to her violation. If it appear to be an affection of long standing, we must adopt the latter conclusion, which ought certainly to weaken her testimony, and cause it to be received with great caution. When it is communicated by the accused, it will not be developed for three or four days after the outrage,

* Dr Mason Good says that this is a possible, rather than an actual case. Edit. 2, v. 5, p. 146.

when it may be known to be recent by those appearances which characterise an incipient affection. Gonorrhœa and lues venera have not unfrequently been met with in young children, from an idea which was, and for aught I know, may still be prevalent among the uneducated and unprincipled of our own sex, viz., that the most effectual method of removing these complaints is, by connection with a virgin. It is highly important to remember, that discharges from the vagina may arise from other causes than violation, and may, as already observed, on the part of those unacquainted with this circumstance, lead to fallacious conclusions. The male may communicate disease to the female, though he be not diseased himself, and *vice versa*. Males, after sexual intercourse with a woman during the catamenia, or while affected with leucorrhœa, have sometimes been seized with a discharge from the urethra, very much resembling gonorrhœa in appearance, but without continuing an equal length of time, or being so difficult of removal. Females, on the other hand, are said to have contracted gonorrhœa from males, who, at the time of connection, were labouring under the irritation arising from stricture.* Young children occasionally have a slimy discharge from the vagina, where no cause except the irritation of dentition, or ascarides, can be ascribed.

Death has, in some instances, been said to have followed the consummation of this crime, especially where several men have been engaged against one woman. When professional men are called to investigate such cases, the aspect of the countenance, the state of the eyes and mouth, and the appearance of the surface in general, as well as of the external genitals, must engage particular attention; after which the pelvic organs must be examined.

One object in examining the features, is to ascertain whether any thing was forced into the woman's mouth, to prevent her crying. In such a case, we might expect to observe swelling of the lips and abrasions of their covering, with suffusion of face, and turgidity of the ocular vessels. In examining the general surface, we must attend also to the condition of the extremities, to determine the existence of fractures, should such marks of violence be present. The general surface, as well as the limbs, may, from the pressure exerted to secure the woman, exhibit discoloured patches at different points; which, soon after the injury is received, will appear livid, and in a few days change to a yellow colour. There may be general tumefaction of the external

* Mall. p. 176.

genitals, more especially in a young person unaccustomed to sexual connection, as also in a matron, where she has been compelled to submit to the intercourse of several males in succession.

When death results, and the external organs have been carefully examined, the pubes should be divided to admit of the vagina, in connection with the uterus, being removed with the least possible injury to this canal. It must be laid open, and the nature of the discharge issuing from it attentively observed,—whether seminal, mucous, purulent, or sanguineous. In a young female not supposed to have had any previous intercourse, it will be of consequence to notice the extent of dilatation of the vagina, and whether the hymen, if present, or the coats of the canal, have been recently injured.

CHAPTER IX.

CONCEPTION.

One great distinction between organized and unorganized matter is, that the former passes away, while the latter remains through time unaltered;—the rock may stand to this day, the same in its nature as it was in the beginning, but plants and animals all fade, and die. Nature has therefore ordained, that the function of conception be called into operation, to prevent the world being rendered a void, and to maintain in unbroken succession the various races and families. The first act towards the production of a new being is, in most animals, the union of the sexes; this is brought about by an instinctive feeling or appetite, which has physical ground for its appearance, or it may be excited in man by the effects of the imagination only. The sexual union is accompanied in most persons by the most exquisite enjoyment of which the senses are capable, denominated the venereal orgasm; this appears to be excited in the female chiefly by the friction of the labia minora and clitoris, which are equally in a state of erection or turgescence. The nervous excitement is frequently so intense as almost to induce a state of syncope. These phenomena are, however, by no means essential to the end of coition, for, as we shall presently see, impregnation may be effected in a purely artificial or mechanical way; and women have borne large families who, far from deriving pleasure from the embraces of their husbands, have endured them with positive disgust and pain.

I shall define conception to be, in the words of Wagner, "the encounter between the generative elements,"—the ovum and male semen.

The minute anatomy of the Graafian vesicle has been already fully described, in speaking of the ovary. It remains, therefore, in this place to detail merely the characters, and properties of the male semen. It is found to consist of a fluid containing granules and animalcules; it almost always contains, also, epithelial cells, from the mucous membrane of the canals through which it has passed. The granules are small rounded bodies, measuring from $\frac{1}{24000}$th to $\frac{1}{33000}$th of an inch. The animalcules or spermatozoa, as they are termed, were first described by Leewenhoeck, but not originally discovered by him; they have an oval flattened body, measuring from $\frac{1}{72000}$th to $\frac{1}{96000}$th of an inch, and forming a $\frac{1}{12}$th or $\frac{1}{16}$th of their whole length; to this body is appended a tapering caudal filament, possessing extremely active powers of movement.

When we reflect how wonderful the function of reproduction appears to our finite intelligence, and how attractive to the enquiring mind, we can scarcely be surprised at the numerous theories which have sprung up regarding it, each displaced by another appearing more veresimilar or plausible than the preceding, as every philosopher, every physiologist, and every anatomist, of any celebrity, has more or less directed his attention to the study of generation. Many of their theories, however, are without a fact to support them, and have no better foundation than the imagination or reasoning of their author; and they would scarcely claim our attention, were it not that we find them attached to some name of note, or from their being curious matter of history. Thus Hippocrates, Pythagoras, and many of the older philosophers, together with Descartes, Buffon, and others in later years, imagined, that during copulation, the female emitted a fecundating fluid; but this idea was rejected by Zeno, and the Stoic school, and in more modern times by Fallopius. Hippocrates, Aristotle, and others, believed, that the seed of the male and of the female were mingled, and that according to whichever of these was the most powerful, a fœtus of that sex was produced. Descartes and his followers imagined, that when the seminal fluids were mingled, a fermentation took place, and a fœtus was formed. Again, it was asserted, that the seed of the male was acid, and that of the female alkaline, and an effervescence ensued, or that, like two chemical agents, they re-acted, a double decomposition took place, and a fœtus was precipitated!

Another set of philosophers, again, thought, that the parts of the fœtus were distributed, (already existing perfectly formed), in the seed of the male and female, and that by the act of copulation they united themselves. The Stoics thought that the fœtus was the produce of the male seed alone, and that the female merely served as the soil, supplying the nutriment necessary to bring it to perfection. Buffon considered the fœtus to be a combination of atoms, from each individual part of the male, or female; this might have led to curious malformations in the case of maimed parents. Nor must I omit the doctrine of Leewenhoeck, derived from his knowledge of the spermatic animalcules, that man was at first a worm, and that his formation was gradually unfolded, as the butterfly is developed from the caterpillar. It does not appear to me that any of the foregoing hypotheses require refutation.

Lastly, we have the doctrine of epigenesis, so strongly advocated by Wolff, which accords much more with the idea of a systematic scientific investigation of the subject than any of the mechanico-chemical fermentations, or decompositions before mentioned. This doctrine may be explained in a few words. Wolff observed, that the seed-vessels, and the seeds also of plants, were merely modified leaves, which modification he showed to depend on perfect arrestment of vegetative action, consequent upon the failure of nutrition; he also demonstrated, that all that was necessary to excite the vegetative action, and enable these organs to produce parts, similar to the ordinary leaves of the parent plant, was the operation in them of the same agency, which acted in the old plant when it developed its ordinary leaves. "The male semen or pollen must be this cause of vegetation which was previously deficient; or, in other words, it must be nutriment in its highest perfection, which is supplied from without, to the part of the plant destined to undergo vegetation." He explains conception in animals on the same principle; considering the ovary, in the animal organism, as the point where the vegetative action is arrested. This theory of Wolff is, to a certain extent, correct, but his conclusion is erroneous; as it must be evident to all that the male semen is far from operating simply as an excitor of vegetative action, for it stamps its own impress on the female germ, and possesses equally with it the power of determining the whole characteristics of the species, be it animal or plant. It is not, therefore, mere nutriment that is wanted, but a fecundating matter which will give integrity to the germ, and supplying to it its deficiency, enables it to

develope a new individual,—not a mere continuation of its own growth, but the product of the union of two other organized beings. I may now show how far the phenomena of conception agree with the doctrine of cytogenesis, which I cannot better do than by quoting the words of Müller, "The cells of vegetables have the power of transforming the nutriment brought into contact with them, into a fluid productive matter, within which new cells are developed. The formation of new cells in thisp lastic matter, the 'cytoblastema' of Schleiden, is determined by the influence of a pre-existing cell, and is effected by a definite process; nuclei being first formed, around which the young cells are developed. Schwann's researches have shown, that the cells of the animal organism grow in the same way. The germ, therefore, which is really a cell, may be regarded as a primary cell, endowed with the powers of producing the specific form of the plant, but defective in the respect of being incapable of producing the 'cytoblastema.' The semen or fecundating matter, on the contrary, though capable of determining the power of the new organic being, contains no primary cells, but resembles more nearly a 'cytoblastema' endowed with the property of producing a definite form, but incapable of vegetating, except under the influences of a primary cell already formed. We may imagine, that when the primary cell, and the "cytoblastema" of the semen are brought together, the vegetation of the primary cell will commence; while, in consequence of both the primary cell of the germ, and the plastic matter of the semen exciting an influence on the products of this vegetation, the new individual must present a mixture of the forms which the germ and semen had respectively a tendency to give, and will resemble both the male and the female parent."*

Having then determined, that the male semen must come in contact with the germ in the female, it remains to prove that it does reach it, and to show how this encounter takes place, and the changes which result therefrom. The accurate knowledge of what passes in the interior of the generative organs of the higher classes of animals, is involved in serious difficulty; we must therefore glance at the phenomena of conception in the lower classes of animals, which will guide us by a sure and simple path to a knowledge of these phenomena in a more complicated form. By the researches of Spallanzani we know that the ova of the frog are fecundated by the male, while seated upon the back of the female,

* Müller's Physiology, by Dr Baly, vol. ii. p. 1503.

shedding his seed upon them as they are being extruded from her body; but when any impervious substance was interposed, the eggs were not fecundated. From the observations of Von Baer, we know that in the osseous fishes the male and female turn their bellies to each other, rub the anal orifices together, and while the milt fish sheds his semen, the female deposits her spawn. In insects again, after the coitus is ended, the semen may be found in the body of the female, collected in receptacula, so placed that the ova must come in contact with it, as they are successively extruded. The accounts given by some of the older authors, of a jet of semen having been traced directly from the vagina, through the uterus, to the Fallopian tube, though possibly correct, are not altogether to be depended on, because the use of the miscroscope was then either not at all, or but little understood, and it is the only means by which such a fact could be determinately ascertained. In later times Prevot and Dumas observed spermatozoa in full activity in the cornua of rabbits, twenty-four hours after coitus. Bischoff has likewise observed them, not only in the Fallopian tubes, but also among their fimbriæ, and even within the peritoneal capsule of the ovary of a bitch, killed half an hour after coition. Wagner too found them alive and vigorous in the Fallopian tube of a bitch, killed forty-eight hours after copulation. Martin Barry has also been able to corrobate these facts. That immediate encounter between the semen and the ovum is necessary to impregnation, is supported by the fact that the ova of many fishes, frogs, &c., have been fecundated by the sperm being applied to them artificially; and Spallanzani and Rossi have impregnated bitches by injecting the recent male semen into the vagina with a common syringe. This shows conclusively that the essential cause of fecundation is not the influence of the male organism on the female, but the action of the semen upon the germ. A case in some measure connected with this part of the subject happened to John Hunter. A person affected with hypospadias, who was desirous of having a family, applied to him for advice. In this individual, whenever he had connection with his wife, the semen escaped by an opening at the radix of the penis. John Hunter recommended him to collect the recent semen and inject it by means of a warmed syringe into his wife's vagina at the moment of venereal orgasm. It is further added that the person followed his advice, and the female became pregnant. It has almost invariably been the custom to speak of this case with ridicule, "*cum connivente oculo*," but I know of no *physiological reason* why impregna-

tion should not follow such an artificial connection. It is now universally admitted, that it is not indispensably necessary for impregnation, that complete penetration of the female should be effected; all that is required is that the spermatozoa be effused within the vagina, perhaps even upon the external parts is sufficient. That the spermatozoa form the essential part of the fecundating fluid, may be deduced from the fact that spermatic animalcules are imperfectly developed in mules, and in hybrid birds, and are absent from the semen of many animals, except at pairing time, nor have they been found in the semen of males at the age of eighty. This question is far from ascertained, by what means do the spermatozoa find their way from the vagina to the ovaries? Various theories have been advanced—vermicular contraction—ciliary movement, and their own inherent powers of motion, each of which I am inclined to adopt to a certain extent. According to the researches of Henle and others, neither the vagina, nor the lower half of the cervix uteri presents a ciliated surface; their transit to this latter point must therefore be effected, partly by their own powers of motion, assisted by a vermicular contraction of the vagina, which we know to exist in the lower animals during the time of their heat, and probably also in the human female. The remainder of the internal surface of the uterus, and also that of the tubes, is ciliated, and from the experiments of Professor Sharpey on ciliary motion, we can easily conceive that the spermatozoa will be readily and rapidly passed over those surfaces. Under these circumstances, we can discover no reason why a coitus effected during sleep or by violence should not be fruitful. The essential requisites in the seminal fluid to insure fecundation are, 1st, That (in the human female,) the semen be shed within the vagina; 2dly, That it be recent; and, 3dly, That it contain spermatozoa.

From what has been detailed, we may conclude that the ovary is the seat of conception; 1st, Because we find that the sperm passing through the Fallopian tube, penetrates the ovary; 2dly, Because fœtus have been found developed to a considerable extent in the ovary; and, 3dly, Because where the Fallopian tubes have been obliterated by accident or design, impregnation has never taken place. I have not thought it worth while to refute the ideas of ancient writers regarding the art of getting male or female children at will, as the bare mention of such a notion appears to me quite sufficient. The earliest changes which take place within the ovum, I shall detail in the chapter on Embryology.

Sect. I.—*Periods of Life and Seasons of the Year in which Conception is most apt to happen.*

These points are much influenced by the health of the individuals, and the climate in which they reside, wherefore much variety will be observed in practice. In warm countries, females conceive earlier than those who reside in cold climates, since temperature, as has been remarked, exerts a powerful influence on the development of the genital organs. In Italy it is by no means rare to find females pregnant at thirteen years of age; in Greece and Hindostan at eleven and twelve. In France early conception is more frequent than in this country. I have in a former chapter alluded to two cases where one of the individuals conceived at eleven, and the other at twelve.* Moyer mentions a Swiss girl who became a mother at nine; and Burdach, on the authority of Mende, states that not unfrequently girls of this age have been impregnated by boys of corresponding years. Early impregnation oftener occurs in Ireland than either in England or Scotland; but in either quarter, we rarely hear of any one being impregnated before the age of fifteen; though, from what happens in other countries, we may presume this might take place at any time after the first appearance of the catamenia. On one occasion the author attended a married lady among the better ranks, who, when she produced her first infant, had not quite attained sixteen years of age; and this child dying six weeks after birth, he delivered this patient a second time before she was seventeen. In high latitudes, as Greenland and other polar regions, as the menses are not secreted until after the twentieth or twenty-second year, early conception must be unknown. A very warm or a very cold climate would seem to impair the fecundity of the sex, since we rarely hear of native females, so situated, producing a numerous family. During their menstrual life, females may conceive at any time; but from observation, I am disposed to think that they are most apt to do so, immediately after the secretion has discontinued. This, however, I am not inclined to ascribe to the os uteri being more patulent, but to the influence exerted by the catamenia on the genital organs. Probably the Graafian vesicles also, are in a state of excitement at this period, and more disposed to be acted on.

From a record of the practice of the late Dr Bland of London, more women conceived between the twenty-sixth

* Sir Everard Home states, that he has known girls of 12 and 13 in this country, become pregnant, Trans. Roy. Soc. Lond. vol. xix. p. 55.

and thirtieth years of age, than at an earlier or later period. Of 20,102 women who had children, 85 were from 15 to 20 years of age; 578 from 21 to 25; 699 from 26 to 30; 407 from 81 to 35; 291 from 36 to 40; 36 from 41 to 45; 6 from 46 to 49. In glancing at a record of more than 9000 deliveries in my own practice, I find the most frequent period of conception to be from the 20th to the 26th year. And in this last, I can find only 17 deliveries after the age of 42 years.

Impregnation at a late period of life must happen more frequently in females residing in temperate climates like ours, than in those who inhabit either polar or tropical countries, as the former arrests the development, while the latter impairs the vigour of the genitals. Pliny states, that Cornelia, of the family of the Scipios, was delivered of Valerius Saturninus when in her 62d year. Valerius of Tarentum delivered a woman in her 67th year; Haller, one in her 63d, and another in her 70th year. Were it not for the cases mentioned by Haller, who was a model of candour and integrity, I should feel very little disposed to rely on the others.

The period of the year at which females are most apt to conceive, would seem, in temperate countries, to be somewhat regulated by the time when the warm seasons are ushered in. A certain elevation or increase of the temperature of the atmosphere tends to excite the passions, which is favourable, though not indispensable to the due performance of all the functions of the genital system. M. Raymond of Marseilles informs us, that the females in that quarter are most apt to conceive in autumn, and chiefly in October; next in summer, and lastly in winter and spring; the month of March being the least favourable. M. Moraud, another French practitioner, states that July, May, and June, are more favourable; while November, March, April, and October are the least so, in the order in which they are mentioned.

Sect. II.—*Causes which determine the Sex of our Race.*

The sex may depend on a preponderating influence, exerted during sexual congress, by either parent. In all countries, except among Europeans at the Cape of Good Hope, the male progeny predominate. In general, there are from 104 to 106 males born for every 100 females; but the proportion varies somewhat in different countries. In Prussia there are 100 females to 105·94 males; in Russia, 100 females to 108·91; in Britain, 100 females to 104·75; among the Jews in the Prussian dominions, 100 females to 113 males; in

Berlin, according to Hufeland, 100 females to 208 males; and among the Jews in Leghorn, 100 females to 120 males. It is considered certain that vigorous men procreate most male children, in proof of which it is stated, that a woman who had a consumptive husband produced five children, who were all females. Nevertheless, weakly men frequently beget males; wherefore, the greater or less vigour of the male parent cannot be considered as the only cause which determines the sex, as it often happens that twins do not resemble each other in this respect.

Among the influential circumstances, the respective ages of the parents may be particularized as operating in determining the sex of their family. With domestic animals it may be remarked, that very youthful or very aged males will beget most females, and that very young or very old females will produce a preponderance of their own sex. An ewe which is impregnated at 2½ years will produce more males than females; at 4½ years, when it is fully developed, the male and female progeny are equal; and in advanced age, when its vigour may be presumed to be on the decline, its male progeny are certain of predominating. Girou states that this occurs more especially when very young or very old ewes associate with vigorous rams of middle age.

In a record of 2000 births by Hofackner, the following were the respective ages of the parents, and the proportion of the sexes produced; of 568 children engendered by fathers who were younger than their wives, 298 females and 270 males were procreated; of 145, from fathers and mothers of equal ages, there were 75 females and 70 males; of 253, by fathers from one to three years older than their wives, there were 163 females and 190 males; of 466, by fathers from three to six years older than their wives, there were 229 females and 237 males; of 191 by fathers from six to nine years older than their wives, there were 85 females and 106 males; and of 273, by fathers from nine to twelve years older than their wives, there were 112 females and 164 males. In Britain, Sadler has arrived at similar results to those of Hofackner: of 263 children, whose fathers were younger than the mothers, there were 141 females and 122 males; of 111, by fathers and mothers of equal ages, there were 57 females and 54 males; of 719, by fathers from one to six years older than their wives, there were 353 females and 366 males; of 585, by fathers from six to eleven years older than their wives, there were 258 females and 327 males; of 240, by fathers from eleven to sixteen years older than their wives, there were 97 females and 143 males; and of 150, by fathers

sixteen years older than their wives, there were 57 females and 93 males. In speaking of the ages of the parents, it must not be forgotten that males, though considerably in advance of their partners in life as to years, they generally also exceed them in vigour; for when females are on the decline, males are often in the prime of life.

It would appear, that females who submit to sexual congress but rarely, produce most of their own sex. According to Girou, ewes after their first conceptions have more of their own than of the male sex. In our own race also, as stated by Carus and Gerson, the female sex predominate in first births; thus in 100 families, there were produced in their first births, 65 females, and 35 males. The proportion of male to female children in illegitimate births, is, generally less considerable than among those born in wedlock: thus in France, from 1817 to 1826, female infants were in the proportion of 100 to 104 males; in Paris, from 1815 to 1827, 100 females to 103 males; in Prussia from 1820 to 1829, 100 female to 102 males; in Hamburgh, from 1817 to 1829, 100 females to 94 males; in Naples, 100 females to 103 males.

In towns, more especially capitals, there are fewer male children produced than in the country: thus in Belgium, from 1815 to 1824, the proportion of females to males was in the towns, as 100 to 106·6; and in the country, as 100 to 106·9. From 1825 to 1829, the proportion was in the towns, as 100 to 105·2; in the country, as 100 to 106·1. In the town of Koenigsberg during 42 years, there were born 31,958 females, and 33,819 males; while in the small towns of eastern Prussia, 388,494 girls, and 411,358 males were produced. Girou states that in those departments of France in which commerce and manufactures are the principal occupations of the inhabitants, there are fewer males produced than in those districts where agriculture is their chief employment. At the Cape of Good Hope, from 1813 to 1820, there were born of European parents, 6,789 females and 6,604 males; among the slave population, 2,826 females and 2,936 males. In the states of Alabama and Mississippi of the American republic, to 70,038 females, 76,067 males were born; while at a more remote period, the following were the proportions, viz. 153,384 females, and 158,113 males; in six large towns, 38,223 females and 38,319 males, were produced.

It follows from the foregoing statistical accounts, *first*, that in cold countries more especially, more male than female children are procreated; *secondly*, that in first gestations, the female progeny predominate; *thirdly*, that in illegitimate deliveries, the male children are not so numerous as in legiti-

mate pregnancies; *fourthly*, that very youthful or very aged males will procreate most female children; *fifthly*, that vigorous fathers will beget most of their own sex, and *vice versa; sixthly*, that when the ages of the parents are equal, the sexes engendered by them will also be nearly in equal proportion; *seventhly*, that when the age of the father does not very far exceed that of the mother, the male progeny predominates; *eighthly*, that females who indulge in sexual congress but rarely, produce more of their own than of the male sex; *ninthly*, that in large towns there are fewer male children engendered than in small towns or in the country; *tenthly*, that in commercial and manufacturing places there are fewer males produced than in agricultural districts; and, *lastly*, that people in a state of slavery produce more male children than those who enjoy freedom.

Sect. III.—*Duration of Pregnancy*,

From the veil which covers the origin of this function, it is difficult in most cases to determine its commencement, and consequently its duration. It is necessary, however, to possess as precise notions as possible respecting it, if it were merely to relieve, in many instances, the mind of an anxious parent; to say nothing of its great importance as a question connected with state-medicine, where doubt exists regarding the legitimacy of an offspring, and where it is requisite to determine the duration of its residence *in utero* with near precision. By universal consent, pregnancy in the female of our race is restricted to forty weeks, ten lunar, or nine kalendar months; and there are some philosophers who maintain that its duration does not exceed this period; but I am at a loss to comprehend how such a position is to be supported.

The sex themselves, who must naturally feel solicitous, date the commencement of gestation from the last appearance of the catamenia; but since conception may happen at any time between the periods, it is obvious that this mode of calculation will require a latitude of at least three weeks. Suppression of the uterine secretion for one or more periods, is another source of uncertainty. Some individuals, while nursing, are impregnated in the absence of the menses; and here it is impossible to determine the commencement of the process. And lastly, some females continue to menstruate for several periods after they have conceived. In the absence of better information, it is sometimes attempted to determine this question by a reference to the period of quickening; but this rule, from the variety which may be remarked

in the different pregnancies of the same individual even, is equally objectionable. In a virtuous woman, casually visited by her husband; or in an unmarried female under similar circumstances with her paramour, the commencement and duration of the function may be accurately ascertained; and in these, it may occasionally be remarked, that the term is by no means restricted to the period above stated; on the contrary that it exceeds it by several weeks or even months. A powerful argument against the regularity with which some pretend gestation to be completed in the human species, may be drawn from what happens in a similar condition, to the lower animals. The cow may be selected as a good example, since her period of gestation is the same as the human female, and since, after a successful interview with the male, she will not admit his embraces for the remainder of gestation; but, notwithstanding this peculiarity, we shall find that the term is not remarkably regular in this animal. M. Tessier has attended to this subject for forty years; and for that time has preserved an accurate register of one hundred and sixty cows. Of this number 14 calved from 8 months, to 8 months and 26 days; 3 at 270 days; 50 from 270 to 280 days; 68 from 280 to 290 days; 20 at 300 days; and 5 at 307 days; so that betwixt the two extremes, there was a difference of more than two months.* From what is stated by Cooper,† in the mare, whose term of gestation is eleven months, the difference between the two extremes among them, has amounted to 132 days; and from this animal also, after a successful salutation, refusing the future visits of the male, illustrations taken from her are as satisfactory as those from the cow. In the oviparous tribe, the irregularity observed in the period at which the bird is emancipated from the shell, is also very considerable. M. Darcet states, that in a hen's nest, which he made the subject of observation, the young appeared in the following order, viz. one the 13th day from the time the hen entered upon her functions; two on the 17th; three on the 18th; five on the 19th; and on the 20th, three remained unfecundated.‡

It is unnecessary to indulge in further illustration, for if we are allowed to draw any conclusions from analogical facts, and we have no other resource where ocular demonstration cannot be made available, we must admit that human pregnancy is not always restricted to any specific number of days or weeks. From the question being frequently agitated in our courts here, I have, for many years, devoted much at-

* Foderè, vol. ii. p. 134. † Beck, p. 196. ‡ Foderè, vol. ii. p. 136.

tention to the subject; and, so far as I could determine, the process was in occasional instances protracted considerably beyond the term allowed by the general consent. Of four cases where the evidence was clear, in one of them pregnancy was protracted eleven days; in a second, thirteen; in a third, a month; and in a fourth, nearly two kalendar months. The two last cases were attended by several corroborating circumstances: both the individuals were respectable, and each had been patients of the author in six previous deliveries; they quickened at the usual period; and they had been accustomed to give birth to large infants; but on the occasions referred to, the children were so much more developed than those that preceded them, that their parents suffered severely during labour. In one of these cases, forceps was required to terminate the delivery, although on all former occasions the labour was easy. In the second patient, the infant was so large at birth, that it has ever since been designated the Giant: this lady became obstructed on the 20th of March 1835, and was delivered on the 17th of February 1836. The fœtus may be retained for several weeks after the extinction of its life, unless this arise from extensive detachment of the placenta, when, in every case of the kind that I have witnessed, its expulsion was effected in less than twenty-four hours from the date of such an occurrence.

Of the causes which we are told are calculated to retard the process, I know nothing farther, than that the oftener an individual is impregnated, I have been led to remark, that gestation was the more likely to be protracted. The causes which render delivery premature, are numerous and much better known to us; but as they will be spoken of under another head, I shall not consider them here. I have often been led to observe, that in females who are pregnant for the first time, gestation seldom exceeds nine months more than a week; while in other instances, they are a few days premature, which ought to be remembered, to enable a practitioner to exonerate an innocent mother from injurious suspicions. In plural births, the delivery is often premature, which may arise either from the volume of the gravid uterus interrupting the functions of the heart or lungs, and consequent irritation; or it may be owing to the inability of the system to contribute the necessary materials for the development of the uterus.

The law, when there is doubt regarding the legitimacy of a child, varies in different countries. In Scotland, it very properly ordains, that ten months after the decease of a

woman's husband shall be the latest period at which an offspring is to be considered legitimate; and six months after marriage the earliest term. The former period I conceive to be no more than just, but the latter certainly affords too great a latitude; since there is not a well authenticated instance on record of a child being reared when born at the conclusion of the sixth month. In France, they are much more liberal in their decisions, than we are in this country; Beck* quotes many cases where infants were considered legitimate, though born at the lapse of more than a year after sexual intercourse between the parents. But in countries where it is scarcely considered any impropriety in a married female to have her paramour, it is not an easy task to legislate. When an individual wishes to determine the period of her confinement, it is better, when the menses have failed to recur, to calculate from the time at which they were expected, than from the time at which they were last seen. By this reckoning, labour will probably come on unexpectedly, which will be more pleasant for the patient, than waiting in anxious expectation after the day appointed has expired.

CHAPTER X.

GENERAL VIEW OF THE GRAVID UTERUS.

We cannot contemplate the uterus at the full time without being amazed at the almost inconceivable change which it has experienced in its situation, volume, structure, and power. In the unimpregnated state, it occupies but an inconsiderable portion of the pelvis; but in a few months after conception, it quits that region for want of accommodation, and at the close of gestation, fills almost the whole abdominal cavity, extending from the upper half of the sacrum, nearly to the ensiform cartilage, and producing great distension of the parietes of the abdomen. In first pregnancies, the uterus has a greater elevation in the cavity than in subsequent gestations, owing to the firmness of the abdominal parietes, which, after repeated pregnancies, become relaxed, and yield under the pressure of the uterus; and hence, in females who have borne several children, this organ projects, as it were, from the abdomen, which, con-

* Beck, p. 198.

sequently, becomes more prominent than in first gestations. In tall persons, it is of an oblong shape; whereas in females of low stature, it spreads more towards the sides of the abdomen, hence its form in them is more spherical. It is not in any instance perpendicular to the horizon, but inclines to either side. In first pregnancies, this inclination is not very conspicuous; but in females who have had several children, it is so marked as to be obvious to themselves: the fundus uteri, in the latter cases, projects more forwards, while the aperture is directed towards the sacrum. When it ascends upon the brim, it produces some changes in the proper contents of the abdomen. None of the intestines can now be placed anterior to it: they are situated towards its sides, and over its fundus; and the colon almost encircles it. In no instance has the author seen a portion of intestine anterior to the uterus in a woman who has died undelivered at the full period of pregnancy.

During the last two months, no part of the uterus is found in the pelvis, except when the brim is unusually capacious. One of the most remarkable peculiarities of the organ is its great size: generally it measures about 12 inches in length, nine in long, and six in short diameter; but its volume is regulated entirely by its contents, which may differ in a given number of the pregnancies of an individual. The figure of the organ varies in different persons; and in the same women even, much depends on the size and number of the fœtus, the quantity of fluid which surrounds them, and certain conditions of the ambient viscera, as enlargement of the liver, spleen, pancreas, or ovaries. Generally, however, it resembles at the full time the bladder of an ox fully inflated: in some rare instances it bears a striking likeness to a heart as painted on cards. While in the pelvis it is flattened anteriorly, and prominent posteriorly; but after it ascends upon the brim, these conditions are reversed, and continue so during the remainder of gestation. The absence, in most instances, of fluctuation in the abdomen during pregnancy, except when the liquor amnii is preternatural in quantity, enables us to distinguish the condition of an individual from one affected with ascites, and prevent the rash use of the trocar.

The uterine parietes, according to Meckel, increase in thickness during the first three months; and from preparations in my possession it is manifest that this observation is occasionally also applicable to the fourth month; but thereafter they generally become very progressively so much thinner until towards the close of pregnancy, that in

an individual of spare habit of body, the more prominent parts of the fœtus may be traced by examining the uterus through the walls of the abdomen;* but from preparations in my collection, obtained at different stages of gestation, the thickness of the organ has continued stationary from the fourth month to the close of pregnancy; while in another instance again of the seventh month, the parietes, in accordance with an observation of Dr Ramsbotham, have rather increased in thickness. No inconvenience can be supposed to arise from the parietes of the organ being thick, but when they are very thin the greatest caution must be observed by the practitioner in endeavouring to effect changes in the position of the fœtus, as, for example, during the operation of turning. As we approach the point to which the placenta is adherent, the parietes are more spongy, and at least a third thicker. Levret compares the proportion which the unimpregnated bears to the gravid uterus, as nine to a hundred and two, or one to eleven and a half; but since the size of the latter varies, and since it contracts rapidly after the evacuation of its contents, even where life is extinct, such calculations cannot be depended on.

Immediately after parturition, the uterus, except where its vigour has been subdued either by over-excitement or protracted action, contracts with inconceivable rapidity into a firm round body, the size of the head of a mature fœtus, after which it is felt at an intermediate point between the umbilicus and pubes. Its parietes after this change are certainly an inch at least in thickness; and the organ will weigh from 24 to 28 oz.; or it will be in proportion to the virgin uterus as 24 or 28 to 1. For the first two or three days after delivery, in a woman who has formerly had a family, especially when the infant embraces the nipple, powerful uterine contractions, alternated by trivial relaxations, supervene at intervals, by which the uterus not only exchanges the loose, spongy texture of its gravid condition for a firmer compact structure, but is also freed from the superfluous blood contained in its enlarged vessels, which gradually become contracted in their calibre, until they are reduced nearly, but not completely, to their original dimensions. The uterus itself, in a vigorous female, is restored to its unimpregnated state in about six or seven weeks, though not again diminished to its virgin size until an advanced age, when also its texture feels as firm as in early life. The uterine

* In Barlow's case of Cæsarean section, the uterine parietes scarcely exceeded the peritoneum in thickness. Barlow's Essays, 1822.

aperture, circular or *slightly* oval during labour, quickly thereafter resumes its unimpregnated form; but with a greater prolongation and thickness of the cervix and lips, most obvious, however, in the posterior one. These parts continue long flabby and corrugated; while the os uteri is considerably dilated, and never afterwards indeed regains its virgin size.

During the decrease of the uterus we have first from the vessels of that organ a sanguineous flow, styled *lochia*, which in a few days assumes a dark greenish colour, and exhales a particularly unpleasant odour. These latter conditions continue for a week or longer, when the discharge becomes inodorous, and of a pale mucous aspect, under which form it gradually subsides.

The uterus is perfectly relaxed in all the stages of pregnancy, at the full time even, as may be ascertained through the abdominal parietes, by the facility with which it yields to pressure: on laying open the organ after death, at the full time, it will be observed that it can receive more than what it contains. This condition facilitates the circulation of the blood through its substance; and renders the organ itself and its contents less liable to be injured by external violence.

Sect. I.—*Development of the Uterus from Conception to the Close of Pregnancy.*

The first cognizable change in the reproductive system after impregnation, is suppression of the catamenia; to which, as already stated, there are exceptions. Probably in less time than a week after conception, the os uteri is sealed by viscid mucus of a light grey colour, secreted by the Nabothian glands; coeval with, or perhaps antecedently to this change, the inner surface of the organ, when carefully examined with the microscope, is found to be flocculent; and very shortly thereafter its vessels furnish a pulpy matter, that gradually becomes consolidated, lines the whole cavity, and, with the mucous plug in the os tincæ, checks the menstrual secretion, unless it be elaborated by the vagina.

Towards the close of the *first month* the uterus will be found at least double its unimpregnated size; and when examined per vaginam during life, the cervix will feel more bulky and elongated, the aperture more oval in its shape, and the organ itself heavier and softer, but its form is unchanged. In the *second* it is three times the size which it acquired in the first month; but there is no alteration in its shape.

The development of the cervix continues; wherefore, as well as from the organ, owing to its own weight, subsiding in the pelvic cavity, its aperture can now be felt nearer the os externum. The margins of the os uteri at this stage become less distinct, and instead of lips we can trace a dimple in the centre of the cervix. In a first pregnancy the os tincæ feels smooth and contracted, while in an individual who has borne a family, it is not only more patulent, but occasionally uneven or fissured, and indurated. At the termination of the *third month*, the fundus uteri is on a level with, but does not, except in a confined pelvis, or when the organ is preternaturally voluminous, ascend above the brim. The fundus inclines towards the pubes, and the aperture to the sacrum; and from the state of excitement of the organ, its increasing bulk, and consequent pressure upon surrounding parts, we can understand the general pelvic uneasiness, frequent desire for micturition, and tenesmus, which occur during the early months of gestation. At this stage of the function, there may be, in females of low stature, slight tumidity of the abdomen, from the floating viscera of this cavity being pushed upwards by the fundus uteri.

In the *fourth month* the fundus approaches more and more to the pubes, and the os tincæ to the hollow of the sacrum: towards the close of this month, except in a female with a capacious pelvis, there is considerable ascent of the fundus through the brim; and unless the individual be tall, marked tumidity of the abdomen. At this period its body measures from five to six inches, and the pelvic cavity, in most instances, affording insufficient accommodation for the organ, it ascends therefrom and becomes an abdominal viscus. After this stage its volume increases more rapidly than formerly; and from the position of the Fallopian tubes, which, at an earlier period, originated somewhat lower than the angles of the fundus, this latter region would seem to grow in a greater ratio than the rest of the uterus. At four months and a half, the organ is scarcely larger than a cocoa nut of moderate size surrounded by its husk; but in fourteen days afterwards, or at the close of the *fifth month*, so great is its increase, that it nearly equals the volume of a fully developed fœtus, and reaches the central point betwixt the pubes and umbilicus. From this period, the obliteration of the cervix, which hitherto would appear to be a *corps de reserve*, commences. In the *sixth month* the fundus reaches the umbilicus, and the depression at this point becomes less obvious. The cervix, which at the close of the fifth month measured an inch and a half in length, is now reduced to an

inch. Owing to the ascent of the uterus, there is an elongation or extension of the vagina, an elevation in the abdomen of the omentum and small intestines, which latter are pushed towards the sides, while some of them slip down behind the organ. The uterus in the *seventh month* is as large as a fully developed fœtus; its fundus reaches from one to two inches higher than the umbilicus; and at the close of this month the cervix is reduced to half an inch in length. In the *eighth* and *ninth* months the fundus progressively ascends from above the umbilicus, into the scrobiculus cordis; but during the last months of pregnancy the uterus increases more in lateral diameter and rotundity than in length; it occasions so much distension of the abdominal parietes as to obliterate the umbilical depression; and the cervix is not only completely effaced, especially in first pregnancies, but there is indeed a considerable dilatation of the os tincæ, even for weeks before the commencement of labour, particularly in matrons. In some rare instances of females who have borne children, we find the cervix as distinct at the commencement of labour as at any period of pregnancy.

The various conditions of the os and cervix uteri, the progressive increase and elevation of the organ, with the consesequent influence of these incessant changes on the form and appearance of the abdomen and its parietes, particularized in this section, have a most important bearing on the duties of the practitioner, both in a medico-legal and practical point of view.

Sect. II.—*Structure of the Gravid Uterus.*

The uterus acquires an augmentation of substance during pregnancy, without which, from its diminutive size in the unimpregnated state, it would be incapable of such mechanical extension as to enable it to receive its contents. It is composed of the same tissues as the ungravid organ, and every one of these grows in a ratio with the progressive increase of what is contained in its cavity. To meet the demand which must thus constantly be made on the system, for aiding in the necessary development of the uterus, is one reason for its being so largely supplied with blood.

It is doubted by some, and actually denied by others, that the uterus receives any acquisition of substance during gestation; but if it does not, it may be asked, how is it that a period of from four to six weeks is required for its reduction to its pristine state? Whereas, if its diminution depended

solely on contraction, as the same philosophers would have us believe, this ought to be accomplished in a few days.

The *muscular structure* of the uterus is still the subject of numerous and discrepant opinions; for, while some differ in their description of the course which the fibres pursue, others deny their existence altogether, since they bear but little resemblance to those in other parts of the body. Their presence in the intestines and in the urinary bladder is admitted, although in these organs they are very unlike such as enter into the composition of the muscles of the limbs, or other parts. But to say nothing of the powerful action of the uterus, which cannot be satisfactorily explained on any other principle than that of its possessing a muscular structure, the fibres can be traced when an opportunity of investigation is afforded, either before or immediately after the contents of the gravid organ have been evacuated. *Firstly*, All mammiferous animals, even the rabbit and the cat, though but small creatures, possess a muscular uterus, as may be satisfactorily felt during life, and immediately afterwards on examination, when the movements of their fibres can be seen. *Secondly*, That the uterus is powerfully muscular, is proved by the hand of the practitioner, after being a short time in it, being partially paralyzed. *Thirdly*, Were a slice of the gravid organ exhibited to an anatomist for his opinion of its structure, he would unhesitatingly pronounce it to be muscular. *Fourthly*, The gravid uterus, like other muscular organs, is excited by stimuli and paralyzed by sedatives, as ergot, and opium or its tincture.

Though the muscular fibres are very greatly developed, yet they do not by any means constitute a large share of the uterine parietes, which are chiefly composed of cellular membrane, and the blood-vessels in a state of great enlargement, which enables us to account for the very plastic condition of the organ. The fibres are far from being regular in their course, and hence the striking discrepancy which must be remarked in the descriptions of celebrated anatomists regarding them. Carpi was the first who said that the uterus was muscular, in which opinion he was supported by Vesalius and Ruysch; but to show how little the latter knew of this subject, he asserted that there was a particular muscle implanted in the fundus uteri to detach the placenta. Loder macerated a uterus for twenty-four hours in a solution of potash, after which he thought that fibres could be distinguished, extending in a longitudinal direction from the fundus to the cervix, where they observed a circular course. According to De La Motte, they are circular in the fundus, and

variously disposed at other points. Rœderer speaks of three planes, which are longitudinal, transverse, and irregular. Petit says, that on the internal surface they appear like bunches, something similar to those of the vesica urinaria; and that on the external surface, they are so dense that they cannot be separated. Leroy points out but two planes, which are circular internally, and longitudinal externally, with a considerable quantity of cellular membrane interposed. Boerhaave, Malpighi, Albinus, Gorter, Walter, Blumenbach, and others, deny the existence of muscular fibres altogether. Walter and Blumenbach indeed declare that they have never seen a muscular fibre in it. Dr Hunter, whose labours in this department merit the greatest attention, describes them as being pretty regularly circular in the body and at the origin of the Fallopian tubes, and forming two concentric circular planes at the fundus, but that they are indistinct at the cervix. After much patient investigation, however, he was obliged to acknowledge, that there was nothing but confusion and irregularity in their arrangement. If we may be permitted to draw any conclusions from the action of the organ at the time of, and after labour, the natural inference must be, that its fibres are disposed in every direction, without which we could not account for that uniform and regular contraction which pervades the whole of it in a ratio with the exclusion of the ovum. In the cervix these fibres are certainly less distinct than in the body of the organ, and hence the more tardy and less powerful contraction of this part.

Both the arteries and veins are greatly enlarged, the latter considerably more so than the former. This change commences from an early period of impregnation, and it is most manifest where the placenta is adherent; they even continue larger and more numerous here than elsewhere, throughout gestation. As in the unimpregnated, so in the gravid uterus, the spermatic are distributed to the fundus, tubes, and ovaries; while the uterine, which are larger than the former, are ramified in the body and cervix. They anastomose freely in all directions, and form an extensive net-work throughout the uterine parietes. In their distribution they are tortuous, perhaps to retard the transit of the blood, that an opportunity may be afforded for the abstraction or deposition of those principles which are required for the enlargement of the uterus, and the advancement of fœtal development. The veins, formerly termed sinuses, owing to their great size, have no valves. They are distributed, anastomose as freely, and have the same course as their corresponding arteries, among the other tissues of the uterus; but instead of be-

ing tortuous they are straight, probably to facilitate the transit of the blood, and prevent injurious congestions.

The *nerves* also participate in the increased development of the uterine tissues. There is not only an enlargement and more free distribution of them in this organ, as observed in reference to the structure of the ungravid uterus; but a similar change is observed in other structures within the abdomen. They are large in the peritoneum; while, in the unimpregnated state, they are so small in this membrane, that some of the most respectable anatomists have denied their existence. It has already been observed, that the unimpregnated uterus is by no means necessary to life, and that it may be diseased to an inconceivable extent without materially affecting health. The gravid organ, however, possesses a large share of vitality; for females have died within a few hours of a laceration of it, where the loss of blood could not account for the event. The fundus and body would seem to be endowed with more vitality than the cervix, since laceration of the latter is not so generally fatal as that of the former. When the increased development of the nerves of the uterus is considered, and the extensive connections of this organ through their medium, we are enabled to account for the powerful action which it exerts, and for many of those sympathies which occasionally arise during gestation.

The *lymphatics* increase both in number and size. They traverse the substance of the uterus in all directions. Some of them are prodigiously large, which will account for the rapid diminution of the uterus after parturition. In the cervix and aperture we find the mucous follicles of Nabothius, which probably constitute the primary seat of malignant ulcer.

Sect. III.—*Changes produced in the Uterine Appendages.*

The broad ligaments in the gravid, when compared to these organs in the unimpregnated state, are seen to have experienced great changes: when an opportunity of examination is afforded at the close of pregnancy, they would seem obliterated. They are so uniformly spread over the uterus that there is not a fold to be seen; the pinions even are not observable. It would appear, therefore, as if it were reserved for these appendages to afford a covering to the uterus during its enlargement.

In the *round ligaments* a change almost equally striking is observed. They are not only greatly elongated, but so much increased in diameter, that they fully equal in thickness the little finger of an adult. This chiefly arises from the altera-

tion which takes place in their blood-vessels, which greatly increase in size.

The ovaries, owing to the expansion of the ligamenta lata, no longer float freely in the pelvis, but are seen clinging to the sides of the uterus. They are not, generally speaking, obviously enlarged during pregnancy. They contain the structure styled *corpus luteum*, which will be fully described in a subsequent chapter.

The Fallopian tubes, for the same reason as the ovaries, are now also more fixed to the sides of the uterus: they experience some change of structure during pregnancy. Their capacity and vascularity is greater than in the unimpregnated state; and the tube corresponding to the ovary which displays the appearance of a corpus luteum, is more dilated than the opposite canal. It is not yet a settled point whether these channels continue open merely in the early months, and whether they do so in some or in all cases. The vessels ramified on the fimbriated extremities of the tubes are in such a state of turgescence as to induce the inexperienced to consider their condition the result of impending inflammatory action.

The vagina, during gestation, receives some slight acquisition of structure. Its parietes become thicker and more vascular; its mucous follicles exhale more freely, and its sensibility is also increased. Until the latter months of pregnancy there is no sensible dilation of the canal; and then the increased capacity is confined to the upper portion only.

CHAPTER XI.

OVOLOGY.

The occurrence of opportunities to observe, in the female of the human race, the earliest changes resulting from a fruitful coition, are so very rare, that anatomists and physiologists have been compelled to have recourse to experiments on the lower animals, for the purpose of investigating this subject. The first alteration which I shall describe, is the expulsion of the ovulum from the Graafian vesicle, and the formation of the corpus luteum; these may, perhaps, not be the first changes which take place, but it will be more advantageous to introduce them in this place, than in a subsequent part of the chapter. According to Barry, when the ovulum is sufficiently mature for fecundation, it is drawn

from the centre of the Graafian vesicle, nearer to the periphery, by the contraction of its retinacula; and when impregnated, it is forced against that part of the vesicle which is in contact with the peritoneum, in consequence of the cavity being in some measure filled up by a reddish yellow substance, and by a thickening of the base and sides of the external covering of the vesicle, both acting as a *vis a tergo*; the point of the parietes of the vesicle, against which the ovulum presses, becomes gradually thinner, then projects above the surface of the ovary, and finally, an aperture is formed, the peritoneum giving way last, through which the ovulum passes into the Fallopian tube. The length of time which elapses between impregnation, and the escape of the ovum from the ovary, has never been ascertained in the female of our own race, and in the lower animals it is found to vary so much that no limited, and scarcely even an average, period can be assigned.

Sect. I.—*Formation of the Corpus Luteum, and transit of the Ovum to the Uterus.*

Observers are by no means agreed, by, or in what structure this yellow body is developed. According to Barry, it is in the external or vascular tunic of the Graafian vesicle; others again imagine it to be external to both coats; a third party state it as the result of their observation, that the yellow matter is situated between the outer and inner tunics; and a fourth set of observers consider it as a growth from the internal tunic. Thus we find it described in every structure, where it is possible for it to be placed, which discrepancy the translator of Wagner's Physiology believes, perhaps with some probability, to depend very much upon the skill which the different observers individually possess, of splitting membranes into layers. I am inclined to adopt the opinion, that the corpus luteum is developed between the tunics of the Graafian vesicle, and that the gradual increase of this matter causes a corresponding diminution of the cavity of the vesicle, and puckering of its inner membrane, which forms the stellated figure in the centre of the yellow body. According to Barry, the inner membrane is absorbed, and cannot be found in the ovary after the lapse of some days from the escape of the ovulum, but a mammillary process projects from the opening, through which it has passed, supposed to be an "inverted portion of the covering of the ovisac."*

* Philosophical Trans. 1839, p. 317.

As late as the fourth month after conception, the corpus luteum always displays in its centre a cavity, sufficiently large to hold a grain of wheat, which is not filled up until about the fifth month; it has, however, been found of considerable size even so late as the sixth month. The aperture through which the ovulum escaped, is closed much earlier, and leaves a cicatrix, easily distinguished on the surface of the ovary. The corpus luteum then, is a rounded or oval body, of a yellowish colour, "vascular, tender, and friable, like glandular flesh;" in its centre are three or more whitish lines, proceeding from a common centre, in short, a stelliform figure. Meckel has stated, as the result of his investigations on the lower animals, that the number of corpora lutea invariably corresponded with the number of young produced; but a later observer has shown, that in the human female twins have been born, and but one corpus luteum was detected in the ovaries, so that the Graafian vesicle must in that case have contained two ovula; this is, however, a very rare occurrence, as the general rule in the human female is, that where twins have been conceived, two corpora lutea have been found. It is now almost universally admitted, that Graafian vesicles cannot be transformed into corpora lutea, unless conception has taken place; this was doubted by some writers, from the circumstance, that Graafian vesicles discharge their contents at other periods than that of conception, and thereby certain changes in structure result, which bear a slight resemblance to those following a prolific coition. These structural changes have received the name of false, or virgin corpora lutea, to distinguish them from those already described; they appear to be formed by an extravasation within the vesicle, or sometimes, perhaps, the coats of the vesicle become thickened, and thus simulate true corpora lutea, for which tubercular deposits have also been mistaken.

The following distinctive marks between true and false corpora lutea appear to me sufficiently obvious:—1*st*, "The false corpora lutea project but little, or not at all, above the surface of the ovary. 2*dly*, The external angular cicatrice is wanting. 3*dly*, They are not capable of being injected like the true corpora lutea, nor do they present any trace of vessels. 4*thly*, Their texture is sometimes so soft, as to resemble the remains of a coagulum, and at other times it appears fibro-cellular, like that of the internal structure of the ovary, but never presents the soft rich lobulated, and regularly glandulated appearance, which Hunter meant to express, when he described them as "ten-

der and friable, like glandular flesh." *5thly*, In form, they are often triangular, or square, or of some figure bounded by right lines. *6thly*, They never present the central white lines, or the stelliform figure, which result from the contraction of the internal membrane of the vesicle. *7thly*, They are much smaller than the true corpora lutea are at first, and there are frequently several of them, apparently about the same period of development, in the same ovary." Corpora lutea frequently disappear about the fourth month after delivery, and are rarely seen after the fifth.

When the ovulum is expelled from the Graafian vesicle, it is received into the Fallopian tube, the fimbriated extremity of which firmly grasps, not only the ovary, but that very point of the parietes of the organ through which the ovulum is to pass. There is no phenomenon, throughout the whole reproductive function, which is clouded with darker mystery than this, by what power the tubes are enabled to implant their extremities at the very spot where they are required as recipients. They are described as being at this time in a highly vascular condition, almost black from congestion, and as it were in a state of erection; and so firmly fixed to the ovaries, as to require some slight violence, and even laceration, to separate them. But may not impregnation be the consequence of the implantation of the tube on the ovary, and not the implantation of the tube the consequence of impregnation? A communication must be established before the spermatozoa can pass from the one to the other; and may not this be one reason among others, why impregnation is most frequent, immediately after menstruation; viz. that the tubes are still in connection with the ovary. In women who have died during menstruation, the tubes have been found highly vascular and congested; they might, therefore, possibly have been in a state of erection, and in direct communication with the ovary; and if they are not implanted on the ovary during menstruation, what becomes of the contents of the Graafian vesicles, which are said to be discharged during that period? According to Wagner, the ovaria occasionally remain for weeks closely grasped by the fimbriæ of the tubes, and in several dissections of women who had died during menstruation, they were found to be filled with menstrual fluid. After the tube has received the ovum, it is said to take on a peristaltic motion, "to writhe like a worm," which, together with the action of its ciliated surface, will easily effect the transit of the ovum to the uterus, as the ciliary motion is said to be from the fimbriæ towards the uterus; but upon this point observers are not quite agreed. It was long thought,

that the ovum underwent no change in its passage through the Fallopian tube, and that it was already enveloped in its true chorion at the moment that it passed from the ovary. It is now however proved, by Barry's observations, that the chorion is formed in the Fallopian tube, as he considers, at the expense of the blood discs, which line its inner membrane in large quantity at the time of conception, and appear, from some of his experiments, to be at this time endowed with vitality in an unusual degree, or it may be formed from the granules of the tunica granulosa, or proligerous disc, which the ovum brings with it from the ovary. The villi of the chorion are also formed during its stay in the tube. The limits of this period are extremely uncertain, as it varies so much, not only in animals of different species, but also in those of the same at different times; it is stated by Müller however as probable, that the human ovum does not reach the uterus before the lapse of a week.

Sect. II.—*Decidua.*

Before the ovum enters the uterus, changes have commenced in that organ, which it will be necessary to consider before tracing its farther progress; this change is the formation of the *membrana decidua*. It has been usually described as a new structure, as coagulable lymph, or something resembling it, and to bear the same relation to the mucous membrane of the uterus, that coagulable lymph does to an inflamed surface. By the recent researches of Weber and others, it appears that this account is incorrect, and that the decidua really is an altered condition of the mucous membrane itself. It had been previously observed to possess on its free surface a tubular structure, either glands or the excretory ducts of glands, and in examining the uterus of a person who was supposed to have been recently impregnated, from the circumstance of a corpus luteum, and a decidual lining being found, although no ovum could be detected, Dr Sharpey observed the decidua about $\frac{1}{10}$th of an inch thick; it appeared to consist of the thickened mucous membrane, and presented an indented cribriform appearance, as if perforated by numerous openings, which, upon a section being made, were found to have been the open terminations of the tubular glands, increased in length and thickness.

The *decidua vera* is, therefore, no longer to be considered as a special membrane, but an hypertrophied state of the glands, or glandular ducts of the uterine mucous membrane,

more highly developed at this particular period, because a greater demand is to be made upon their peculiar functions. The villi of the chorion are inserted in and among these tubuli, and by imbibition through these structures, we may presume the ovum to be nourished during its earlier stages. Cells have also been described in the human decidua, containing a "milky chylous fluid;" but although probable, it is not yet ascertained, that the tubular ducts communicate with these cells. In recently impregnated uteri, which have been minutely injected, these tubular glands are found every where surrounded by meshes of vessels; and large veins have also been observed ramifying among them, and freely communicating with the uterine veins. The decidua has been seen lining the uterus on the seventh day after coition; and is present in the uterus whether the ovum arrive there or not, as will be shown in the chapter on extra-uterine gestation; it also passes a short distance up into the tube, on that side on which the corpus luteum is found. As soon as the ovum arrives at the uterine end of the Fallopian tube, it encounters the decidua, which it pushes before it for a short distance, and becomes imbedded in it; the portion of the decidua which is pushed forward by the [redacted] has been termed the *reflexa*, or *fœtal*, to distinguish it from that portion lining the uterus, which is termed the *decidua vera*, *uterina*, or *maternal*. As the ovum increases in size, the decidua reflexa grows in proportion, and continues to form one of its coverings. Dr Hunter was the discoverer of the decidua reflexa, and his description of it was so accurate that it even went by the name of the decidua of Hunter.

Until about the third month, the cavity between the decidua uterina, and the decidua reflexa, contains a considerable quantity of fluid; it is then absorbed, and the two layers of decidua come so close into contact, that it is difficult to distinguish them after that period. The circumstance of the decidua being reflected from off the walls of the uterus, over the ovum, has naturally been brought forward as an objection to the theory above given, of the decidua being merely the altered mucous membrane of the uterus; it is one, however, which may be easily disposed of. If the decidua reflexa were merely a duplicature of the decidua uterina, the structure of both would be the same, but this it is found not to be, as it is nearly perfectly destitute of the openings that I have mentioned above as characteristic of the deciduav era; these are almost solely confined to a ring of the membrane, adjoining the angle of reflexion, that is, immediately bordering on the decidua vera,

the remainder of the decidua reflexa being totally different from it in structure.

From a knowledge of these facts, "it is suggested, that the minute ovum, on its entrance into the uterus, is covered with exuded lymph, either entirely, or on that part of its surface which does not adhere to the uterus; that as the ovum enlarges, a circular fold of the altered mucous membrane is drawn upon it all round its adhering part, enveloping the ovum to a greater or less extent, and afterwards forming the cribriform, zonular portion of the decidua reflexa, whilst the remaining thin, smooth portion of the latter membrane, which is more distant from the line of reflexion, and is destitute of apertures, is formed by an extension of the lymph covering;"* thus, then, the ovum must pass through the decidua uterina. At one part the ovum is not covered, either by the decidua uterina or reflexa; that is, at the point where it first encountered the decidua, and where the placenta is subsequently formed, another membrane, however, termed the *decidua serotina*, supplies its place. This latter membrane is analogous in structure to the decidua reflexa, and in continuation with the reflected zonule of the decidua vera. In confirmation of the foregoing observations on the nature of the decidua, I may remark that of Von Baer, and Hunter, who were both unacquainted with them, the former states, that "at a later period the connection between the decidua, and the mucous membrane, becomes so intimate, that it is impossible to separate the former, without also separating the latter from the fibrous tissue of the uterus;" and Hunter says, "the adhesion of the decidua to the *muscular fibres of the uterus*, is rather stronger than the adhesion between the external and internal stratum, which is, we presume, the reason that in labour it so commonly leaves a stratum upon the inside of the uterus."

Sect. III.—*Chorion.*

The origin of the Chorion has already been mentioned in a previous part of this chapter, it therefore remains to speak merely of its further development. It is a thin transparent membrane, consisting of two layers; it is much thicker during the early months of pregnancy than afterwards; its thickness is then also uniform, and it is closely studded with villosities, which, in the second month, become larger and more fully developed; in the third month, however, they are

* Müller's Physiology, Trans. by Baly, vol. ii. p. 1580.

said, by some authors, to disappear in a great measure, commencing at the lower part, the external surface thus becoming almost perfectly smooth, except at the point where the placenta is to be formed; there the villi are longer, more fully developed, more closely accumulated, assuming a dendritic appearance, increasing in much greater proportion than in other places, and pushing their arborescent ramifications deeply into the decidua serotina, in order to form the placenta. I am, however, inclined to agree with Müller in his statement, that the chorion does not lose its villi, but that they only seem to disappear, in consequence of the interspaces between their clusters becoming larger as the ovum increases in size, and more resembling flattened vesicles than villi. It is now almost generally agreed that the chorion is totally without vascularity; from its inner wall, however, a vascular lamina may be stripped off, but only over the placenta; this has been called the *Endochorion*, in contradistinction to the outer layer, the *Exochorion*.

Sect. IV.—*Tunica Media.*

A tunic, under the name of *tunica media*, has been described as lying between the chorion and amnion. When subjected to microscopic examination, it appears exactly similar to cellular tissue; and we may suppose it to bear the same relation to the chorion and amnion, which the fibres of cellular tissue bear to the muscular fasciculi between which they lie; but in the early months it has a gelatinous appearance.

Sect. V.—*Amnion.*

It will be necessary to defer the description of the origin of the amnion, until we enter on the subject of embryology, and the early changes experienced by the germinal vesicle. When fully developed, it forms the inner membrane of the ovum, and, however numerous the fœtus, each is enclosed in a separate amnion. The membrane is diaphanous, loosely connected with the chorion, except at the placenta, and occasionally so strong as to retard the expulsion of the fœtus. A quantity of fluid is sometimes found between the chorion and amnion, styled *the spurious waters*, in contradistinction to that contained within the latter membrane. In the early stages, the amnion occupies but a small portion of the cavity of the chorion; in the sixth week, not more, perhaps, than two-thirds; it gradually enlarges, and about the third or fourth month, the chorion and amnion are in close contact.

The sac of the amnion contains a considerable quantity of fluid, termed the *liquor amnii*, or *the Waters*.

Sect. VI.—*Liquor Amnii.*

This fluid resembles very much in appearance the serum of the blood; it has a distinct saline taste, and consists chiefly of water, containing albumen and gelatine in small quantity, also muriate of soda and ammonia, phosphate of lime, and a peculiar acid termed amniotic. I have observed it to contain globules much resembling those from the thymus gland. It is not yet determined whence this fluid is secreted, but we cannot doubt that it is poured out from some part of the maternal structures. Its specific gravity is less than water. The quantity varies not only in different women, but in the same individual in her different labours. In some instances, it does not exceed a few ounces, or it is so inconsiderable, that the practitioner is scarcely aware of its presence; and again, on the other hand, it may be exceedingly copious: from fifteen to twenty ounces may be considered an average proportion. This fluid, in occasional instances, in consequence of inflammation of the amnion, as it is supposed, has been known to exceed a gallon, and to destroy the fœtus by impeding its respiration, when, after its expulsion, the face is placed undermost.

The liquor amnii probably serves, in no inconsiderable degree, as nourishment to the fœtus, because when the child, at the full time, is large, the quantity is small; when, however, it is diminutive or delicate, or has been dead for some time, the amount of fluid is greater. In the former case, the fluid may have disappeared by absorption; in the latter, it may not have been taken up. In the early stages of gestation again, when the vascular connection between the mother and fœtus is not thoroughly established, it is proportionally more copious than in the latter months, and its solid elements are also more abundant. Besides supplying nourishment to the fœtus, the liquor amnii is an agent of great consequence, both during gestation and parturition, as from the incompressibility of the fluid, it protects the parent in the later months against injury from the active movements of the fœtus, and the latter, in a great measure, from the effects of violence or pressure; and upon the same principle also, it prevents the circulation in the funis being retarded: during labour, by distending the membranes in the shape of a cone, it very much facilitates the transit of the fœtus by gradually dilating the os uteri and the passages, as well as by lubricating these parts.

Sect. VII.—*Placenta.*

We have already stated that it is formed by the villi of the chorion, penetrating deeply into the decidua serotina, "which at this point undergoes an excessive development, and penetrates the substance of the fœtal placenta, passing between the tufts of the villi, even as far as the chorion." The human placenta is therefore composed of two parts, the fœtal, originally being the villi of the chorion; and the maternal, the decidua serotina. According to Wagner, the villi are concentrated at the spot where the placenta is to be formed, by the formation of vessels from within from the endochorion; here they continue to grow, elongate, and spread out like to the branches of a tree; their extremities are blunt and rounded, and along its sides each villus presents projections, somewhat similar to the rounded toothings of an oak leaf. The extremities are frequently bifurcated, as if the villus were in process of being continued in two separate portions. And it is probably in this way they increase,—each extremity dividing, and thus giving origin to two other branches, which again divide in the same way. Each particular villus, and each of these rounded extremities and projections, to which alone Weber confines the term villus, (denominating the large branches from which they spring, "the stems of the chorion,") contain one or more capillary vessels, an arterial branch communicating with a venous one, all carrying the fœtal blood: some of these capillaries are large enough to contain two or three blood globules abreast, others can admit only one; these may be distinctly seen with a magnifying power of about 300, through the walls of the villus and the capillary, which are rendered somewhat more transparent, by the addition of a drop of acetic acid.

Various descriptions have been offered of the channels through which the blood of the mother circulates in the placenta. Formerly, it was very generally believed, that the large veins of the uterus ended upon its inner surface with open mouths, which were closed by the membrana decidua, and that very small vessels only penetrated this membrane. The Hunters thought that the maternal blood passed into cavities, and the present opinion is not far removed from this idea, as, according to the observations of Weber, who has investigated this subject with great diligence, the blood is brought by the arteries of the uterus, which have a peculiar twisted course, to the placenta, where it is received in capillaries, or canals of very large calibre, or enlarged veins; their parietes are extremely thin, and are thought to be formed by the in-

ternal tunic of the maternal veins. These canals give off no branches, but merely form the connection between the uterine arteries and veins; the walls of these channels of communication being so extremely delicate as not to be separable, or demonstrable, by any dissection, was probably the reason why the Hunters looked upon them as cavities. Each lobule of the placenta is composed of one of the vascular villi of the chorion, with its branches; and in the interspaces between them, run the delicate walls of these canals, carrying the maternal blood. According to the views of others, the inner membrane of the venous system of the mother is prolonged over each individual tuft, so that we are to consider the maternal part of the placenta as a large sac, the walls of which are reflected over each villus, and not as consisting of "enlarged veins," or "capillaries of very large calibre," ramifying among the fœtal tufts. This sac is bounded, and strengthened on the fœtal side, by the chorion, and on the uterine side, by the decidua; and the blood, being thus confined by the inner membrane of the maternal venous system, is brought to the placenta by the uterine arteries, and returned by the corresponding veins, without ever passing out of the vascular system of the parent. The villi of the fœtal placenta have also been observed to penetrate into the uterine sinus, and to be there bound down, and covered by a reflection of the inner venous tunic of the mother.

Whichever of these views may be the correct one, they agree in the main point, viz. that there is no direct vascular communication between the mother and fœtus, and that the circulatory system of each is in itself perfectly distinct and separate. Between the two foregoing views, there appears to be little more than a difference of words. What the one observer calls canals, the other terms a sac into which the innumerable villi project in all different directions; now, if a sac is divided by prolongations, projecting into it in all directions, completely from one side to the other, it will then assume the appearance of canals, of irregular, and it may be, wide calibre. Again, the one anatomist says, that the inner venous tunic of the mother winds among the fœtal tufts in all directions, and the other that the tunic is reflected over them; it appears to me that it is quite immaterial, whether we are told that the peritoneum winds in all directions among the abdominal viscera, or that it is reflected over each organ, either in whole or in part. It was known to the Hunters, that each fœtal villus contained a branch from the umbilical artery and vein, and that they there communicated; they however did not admit, that the

fœtal villi passed through the decidua, which I have above mentioned as being lately determined.

The placenta is a spongy lobular mass of great vascularity, lying between the decidua and chorion, and cohering in a large majority of instances, to the upper regions of the uterus,—very frequently to the angle where the Fallopian tubes terminate, and, in some rare instances, to the cervix, constituting a formidable variety of labours. When fully formed, it measures from six to seven inches in diameter, one and a half in thickness through the centre, but it is thin at the margin, two feet in circumference, and from eighteen to twenty-four ounces in weight. Baudelocque states that the size of the placenta is proportioned to that of the fœtus, but my experience does not confirm this observation, as I have frequently seen a small fœtus with a large placenta, and *vice versa*. It is most frequently oval in shape; sometimes it is divided into halves, at other times into three or more portions, and whatever number of fœtus may be *in utero*, each has a placenta proper to itself: these may either form distinct masses, or be joined by a process of the membranes; but there very rarely appears to be any vascular connection. The uterine surface of the placenta is convex, rough, and deeply sulcated; but the fœtal is concave, smooth, and glistening, exhibiting the umbilical vessels, numerously ramified.

This organ is liable to morbid changes: sometimes it is so soft that it is lacerated during extraction; at other times we find some parts of it very much indurated, hydatids imbedded in its structure, portions of it converted into bone, or calcareous deposits contained in its substance. Professor Naegelè, and others, published cases in which the mass had been greatly reduced in size by absorption. I have observed, when the fœtus had been destroyed by syphilis, that the placenta was larger, softer, and whiter than usual. The placenta is the medium throngh which, by means of the funis, the fœtus receives from the parent what is necessary for the support of intra-uterine life and progressive development, as is proved by an extensive detachment of the mass from the uterus, or compression of the funis of very short duration, being destructive of fœtal life.

Sect. VIII.—*Funis Umbilicalis.*

The funis is a vascular cord, extending from the umbilicus of the fœtus, to the placenta. It consists of two arteries and a vein, imbedded in a delicate fibrous tissue, the interspaces of which are filled with a gelatinous matter, easily

expressed by the fingers. The arteries arise from the internal iliac of the fœtus, and passing out at the navel, run spirally through the cord from left to right without any communication between them, but they innosculate freely in the placenta; their terminations, together with the origins of the umbilical vein, constitute the vessels of the placental villi described above; the vein is formed by numerous branches, which coalesce on the fœtal surface of the placenta, to form one large trunk. Sometimes there is only one artery, but then its area is equal to the sum of those of the two ordinary vessels, which are occasionally longer than the veins, and form loops in the cord. The funis is sometimes found to have one or two knots formed upon it, probably by the fœtus, when very small, passing through a loop; it is inserted into the placenta at some point between the centre and the edge, occasionally into the very edge, forming the "battle-dore placenta" of Hunter. The venous branches on the fœtal surface of the placenta are much larger than the arterial, and are without valves; the vein is also frequently varicose. Besides the vessels already mentioned, the cord contains the *ductus omphalo-entericus*, or pedicle of the umbilical vesicle, the *omphalo-meseraic vessels*, and *the urachus*, all of which will be more particularly described, when we come to the subject of embryology: until the third month it also includes a part of the intestinal canal; and a filament of nerve from the solar plexus has sometimes been traced extending a short distance in its structure. These vessels, and the substance of the cord, are bound together by the amnion and chorion, which cover it throughout its whole extent from the umbilicus to its insertion into the placenta. From this point it is reflected over the fœtal surface of the mass, and then lines the inner layer of the chorion. The cord has been found attached to other parts of the body, besides the umbilicus. Meckel states, that he saw a preparation in the anatomical museum of Brussels, where it arose from the head of the fœtus. The umbilical cord first becomes visible about the fifth or sixth week: previous to that period the embryo adheres directly to the membranes by its caudal extremity; from this time the vessels, which were at first straight, become gradually twisted, and the cord progressively increases until the full time, when its average length is from eighteen to twenty inches, but it is exceedingly various in this respect, as Baudelocque has seen it measure fifty-seven inches, and on the other hand, it has been met with not more than four or five. It also varies much in thickness: occasionally we find it small and delicate, at other times again, it equals in diameter the wrist of a

young child. This increased bulk is owing to an unusual deposition of gelatinous matter, and when met with, more than the usual caution should be observed in securing the funis, which collapses after its division, and permits, from the ligature thus becoming loose, an effusion of blood from the vessels which the author has known to prove fatal. The only precaution necessary, when the cord is thick and bleeds, is a simple one, viz. to apply a second ligature nearer the fœtus, than the first.

Sect. IX.—*Nutrition of the Ovum and Fœtus.*

As the chorion and its villi are composed of nucleated cells, we can easily understand their growth, previous to the development of vessels, and we may consider the villi of the chorion, to be to the fœtus, what the spongiolets are to plants; this resemblance holds good, not only in the earlier stages, but even when the ovum is mature; the spongiolets are merely a loose layer of lax cellular tissue frequently containing ducts, the nutriment of the plant is attracted by them from the surrounding medium, and is passed from one cell to another until it reaches the ducts. In the human ovum the process is the same—the nutritious matter is taken up by the villi, and passed through their cells to the vessels, which they contain; after the circulation in the placenta, both fœtal and maternal, is fully developed, it is evident that the ovum is supplied with nutriment, by its villi being there bathed in the maternal blood; but previous to the placental connection, we must suppose the nourishment of the ovum to be maintained by some matter afforded by the decidua, in short, some material elaborated by the uterine glands. I believe this to be the only use of the decidua, although Velpeau has ingeniously imagined, that its office was to prevent the ovum sinking in the uterus, and the placental attachment being formed over the cervix; I have stated in a previous page, that a "milky chylous fluid" had been discovered in the cells of the decidua, and that I had observed liquor amnii to contain globules nearly identical in appearance and properties with those of the thymus gland, which again are known to bear a strong analogy to those of chyle. These two facts contribute much to strengthen the belief which I have expressed above, as the amnion may by the action of its organic cells absorb from the chorion the matters which its villi have taken up from the decidua, and deposit them in the liquor amnii, as nourishment for the fœtus; and it is also well ascertained, that the solids of the liquor amnii are much more

abundant during the early months of gestation, but when the placental connection between the mother and fœtus is fully established, the nutritive powers of the liquor amnii can exert but little influence.

CHAPTER XII.

EMBRYOLOGY.

Although the human ovum has been seen by Home and Bauer in the uterus at the seventh day,* and by Weber and others, at periods varying from a week to twelve days after impregnation, yet in none of these was the embryo observed; perhaps the earliest which has been seen is that mentioned by Von Baer, in an ovum of about fourteen days. As we are therefore unacquainted with the earliest changes towards the formation of the embryo in the human female, I am obliged, for illustration, to have recourse to the observations of Dr Martin Barry, than whom no one has, with greater success or industry examined in the mammalia, the changes resulting from impregnation. Until the publication of his researches, the chick was the only animal in which we were thoroughly acquainted with the process of the development of the embryo by a connected series of observations; although there is a strong analogy, it still differs in some points from the development of the embryo in mammalia, and as it is not the office of this work to treat of comparative physiology, I beg to refer the reader for those points to the the very excellent article on *Generation*, in the Cyclopædia of Anatomy and Physiology, by Professor Allen Thomson. In this place, I shall confine myself almost exclusively to what has been seen in some of the mammalia—the rabbit and bitch being those which are best known; and throughout this chapter, I shall follow an arrangement, nearly the same as Müller's division of the Development of the Embryo into three periods.

* Very little credit is attached, in the present day, to this observation of Sir E. Home, and I should not have mentioned it were it not strongly supported by one or two writers of note, who allege, that it is discredited by Sir Everard's enemies only. Bauer attempted to preserve this ovum, by drying it on a plate of glass, on which Von Baer remarks, that he might as well have roasted it, or boiled it.

Sect. I.—*First Period. From Impregnation to the appearance of the Embryo.*

I stated, in considering the previous subject, that when the ovum is sufficiently mature for fecundation, it is brought by the action of its retinacula to the periphery of the Graafian vesicle, the germinal spot, at the same time, passing to the surface of the germinal vesicle, and the germinal vesicle to the surface of the yolk; after impregnation has been effected, the germinal spot and vesicle again return to their original places.* About the same time, there arises from the surface of the germinal spot, a membrane which gradually enlarges and applies itself to the inner surface of the germinal vesicle, which, accordingly, becomes less transparent, and less easily ruptured, and when burst, does not collapse, the germinal spot becomes much enlarged, and a clear point appears in its centre; the vitellary membrane, which was previously extremely thin, becomes suddenly thickened, and a minute space, filled with a transparent colourless fluid, is observed between it, and the thick transparent membrane—the *zona pellucida*, which envelopes it. All the preceding changes have been observed to have taken place in the ovum before it had left the ovary.

The ovum is forced from the ovary by the *vis a tergo* operating, not directly upon it, but through the medium of the tunica granulosa, and retinacula, or proligerous disc; it then enters the Fallopian tube, where the thickened vitellary membrane disappears by liquefaction, so that the zona pellucida forms the immediate envelope of the yolk, and is covered on its outer surface by an extremely delicate membrane, which becomes the true chorion. The membrane of the yolk is sometimes of a brownish colour, and appears minutely granulated on its surface. "In the centre of the yolk, there arise several very large and exceedingly trans-

* Since writing the chapter on Conception, I have met with the following observations, in a recent work. "There is little reason to regard the spermatozoa as independent animalcules, since ciliated epithelium cells, and even blood corpuscles, under certain circumstances, may exhibit as much activity, and there is no evidence that their function is any higher than that of the pollen tube of plants, which conveys into the ovulum the germs of the first cells of the embryo. What was said on the subject of fecundation, leaves scarcely any doubt, that this act consisted in the introduction of some new element into the ovule, through the medium of the spermatozoa. All doubt of their penetrating the ovum has recently been removed, by the observation of Dr Farre, on the ovum of the earth worm, which he has distinctly seen to be penetrated by the spermatozoa." If the spermatozoa are merely ciliated epithelial cells, this throws some doubt on the mouth, anus, and organization figured by Valentine. *Vid.* Wagner's Physiology, Trans. by Willer, Part I. p. 228.

parent vesicles. These disappear, and are succeeded by a smaller and more numerous set. Several sets thus come successively into view, the vesicles of each succeeding set being smaller and more numerous than the last, until a mulberry-like structure has been produced, which occupies the centre of the ovum; each of these vesicles contains a colourless nucleus, and each nucleus a nucleolus.

In the uterus, a layer of vesicles of the same kind as those of the last and smallest set here mentioned, makes its appearance on the whole of the inner surface of the membrane investing the yolk. The mulberry-like structure then passes from the centre of the yolk, to a certain part of that layer, (the vesicles of the latter coalescing with those of the former, where the two sets are in contact, to form a membrane, the future amnion), and the interior of the mulberry-like structure is now seen to be occupied by a large vesicle, containing a fluid and dark granules. In the centre of the fluid of this vesicle is a spherical body, composed of a substance having a finely granulous appearance, and containing a cavity filled with a colourless and pellucid fluid. This hollow spherical body seems to be the true germ. The vesicle containing it disappears, and in its place is seen an elliptical depression, filled with a pellucid fluid. In the centre of this depression is the germ, still presenting the appearance of a hollow sphere. From the germ the embryo now begins to be formed. The germ separates into a central and peripheral portion, both of which, at first appearing granular, are subsequently found to consist of vesicles, the central portion occupies the situation of the future brain."* Such are the observations of Dr Barry, and as will be seen in the next section, his statements are in many points at variance with those of all other observers.

Sect. II.—*Second Period. From the appearance of the Embryo to its connection with the Chorion, by the Allantois.*

In the chick the first trace of the embryo is seen after about twelve hours' incubation, in the shape of a line or streak, the *nota primitiva s. cicatricula*, in the middle of the *area pellucida, s. germinativa*, or the clear space in the centre of the *blastoderma, s. germinal membrane*, a structure which first shows itself as a thin layer of yolk of definite extent, gradually becoming membranous, and finally involving the whole yolk. This membrane divides into two layers,

* Philosophical Transactions, Part II., 1839, p. 351.

the outer the *lamina serosa*, and the inner, next the yolk, the *lamina mucosa*. The embryo is said to be formed in the substance of this membrane; it is at first on a level with the lamina serosa, but gradually rises above it. In the mammalia, nearly the same changes are said to result. In them, as in birds, the nota primitiva is believed to be the rudiment of the spinal cord. At the extremity which is to be the cephalic, it is thicker and more strongly bent downwards, than at the caudal; on either side of it there appears a body, the *laminæ dorsales*, which gradually unite to form the back of the embryo, but before their union is completed, four square plates appear, the rudiments of the vertebral column. After the coalition of the dorsal laminæ, the embryo begins to bend in upon itself, first the head, and then the tail tending downwards; "at this epoch it is also becoming more and more distinct from the blastoderma, which has now grown around the yolk, as an elongated bladder or vesicle, and is still in free communication with the boat-shaped abdominal cavity of the embryo."

Vessels may be seen running from the embryo to the blastoderma, which are the omphalo-mesenteric trunks. The abdominal laminæ are sent off from the dorsal, and converging, assist in closing up the cavity, thus the channel which leads from the yolk sac to the ventral cavity, becomes gradually constricted, and the yolk sac then receives the name of the *umbilical vesicle;* "this body separates itself more and more from the abdomen of the fœtus, merely a duct of communication passing to that portion of it which forms the intestinal canal. The first rudiments of the cord will be found at this separation; its fœtal extremity remains for a long time funnel-shaped, containing, besides a portion of the intestine, the duct of the vesicula umbilicalis, the vasa omphalo-meseraica, (the future vena porta), the umbilical vein, and the early trace of the umbilical arteries." The spinal cord and brain are formed, the latter appearing divided into many vesicles; the eye and ear are indicated, and the intestinal canal is in process of formation.

The *amnion* is the next organ which commences to be developed. According to Barry the structure which originates it, is no part of that which constitutes the embryo, but is formed from an epithelium-like layer of cells, which lines the investing membrane of the ovum, and from the outer cells of the mulberry-like body, which together, constitute a layer corresponding to the "lamina serosa" of authors.

As I do not find an account given by any author of the development of the amnion in the mammalia specially, I

shall describe it from the observations made on the chick, as Müller and Wagner appear to agree with Von Baer in thinking that both it and the allantois are "doubtless developed in the same way in the mammalia as in birds." The first traces of the amnion appear in the chick about the third day of incubation. The embryo, with the contiguous part of the germinal membrane, rises above the level of the rest of that structure, its cephalic extremity bends downwards and forwards, this causes that part of it to sink below the level of the outer layer, the lamina serosa, which gradually rises and is prolonged over its dorsal region. The same process takes place at the caudal extremity of the embryo, until the two prolongations meet, and thus enclose the embryo in a shut sac—the amnion. This differs in some degree from the account given by Dr Barry of the formation of the amnion, as he does not admit that the embryo is formed in the substance of a membrane,—nor does he allow that there exists in mammalia a structure entitled to be called the germinal membrane, as he states the membrane to be produced by the germ, not the germ by the membrane; the majority, however, of those who have investigated the subject, appear to be opposed to his views. All the changes above described, have been seen to have taken place in the ova of the bitch, previous to the eighteenth day.

At this stage of development a small vesicle springs from the inferior end of the intestinal canal to become the *allantois*, which forms by its outer layer, a connection with the chorion. Of the allantois and umbilical vesicle, I shall speak more fully in a subsequent part of this chapter.

It is unnecessary to follow the process of the embryo further in the lower orders of the mammalia, because human ova have been seen at this period of development, and accurately figured and examined by Von Baer, Wagner, Müller, and Allen Thomson; it will be better, therefore, instead of continuing the detail of the changes in the ova of the bitch, to describe them in those of the human female.

It has been stated, that man at one time bears a resemblance to a fish, at another time to a reptile, and again, at a different period, to a bird: this however, is not correct, for he bears an equal resemblance to all of them at the same time; in fact he bears to each of them the same resemblance which they bear to each other, and that is merely the resemblance which one vertebrate animal bears to another. "At first, therefore, the fish, the reptile, the bird, the mammal, and man, conform very closely to the same type, but in the progress of their development they gradually depart from it; the

extremity for example, which was at first the same in all, by degrees assumes the form of a fin, a wing, a paw, or a hand."

According to Devergie's account of an *ovum of the twelfth day*, the ovule formed a vesicle in the middle of another, four times larger than it; the embryo was scarcely perceptible, or defined only by a little circle; there was no placenta, but there appeared traces of an umbilical cord; the chorion was villous—the amnion formed the fourth part of the ovum—the umbilical vesicle was as large as a pea, placed between the chorion and amnion, and containing a matter analogous to the yoke of an egg, and its pedicle entering the cord. The "allantoic vesicle was lying between the chorion and amnion, composed of two laminæ, and disposed about the amnion and umbilical vesicle.*

The *ovum of about twenty-one days*, contained in the decidua, measures nearly seven lines in length, but deprived of its decidual covering, it is only about five lines; the chorion is covered with villi, which scarcely penetrate the decidua; the embryo itself is only about two lines long; "it is distinctly surrounded by the amnion, which lies loosely but still pretty closely about it, and obviously proceeds from the abdominal laminæ;" the hemispheres of the brain, the corpora quadrigemina, and eye are tolerably distinct; the ear indicated; the branchial arches, (the band-like divisions at the cephalic extremities of the abdominal laminæ), are also visible: between the first two of these the mouth is formed. The abdominal cavity appears as a large gap in the inferior portion of the embryo; from this cavity "the heart projects like a hernia, it is already of very large relative dimensions, and consisting of a simple atrium, or auricle and ventricle;" behind the heart is seen the liver, and behind the liver the intestine, attached by means of a distinct mesentery. The intestinal canal makes a considerable curve into the umbilical vesicle, which is at present nearly as large as the embryo itself; on either side of the mesentery are observed the bodies which give origin to the kidneys, the *corpora Wolfiana;* from the lower end of the intestinal canal, the allantois presents a flat, broad, well-defined vesicle, the outer layer of which is found attached to the chorion.

* Devergie, Médecine Légale, vol. i. p. 539.

SECT. III.—*Third Period. From the attachment of the Allantois to the Chorion, until the complete formation of the Placenta.*

Embryos of the fourth week are about three lines and a half in length. The brain, eye, ear, and branchial arches are now much more fully developed. The extremities have increased in size, and form rounded detached leaflets. The heart, liver, and intestines, have also considerably advanced; the constricted part of the umbilical vesicle is lengthened out into a long filiform pedicle; the canal of the allantois is also longer and narrower, and funnel-shaped towards its outer extremity; there is a considerable space between the chorion and amnion; the cephalic and caudal extremities of the embryo are brought into close contact, in consequence of its bending upon itself. At this period the human embryo bears the greatest resemblance to those of the other vertebrata.

The embryo from the fourth to the eighth week.—Development is more rapid during this month, than during any other period of equal extent, and we fortunately possess numerous descriptions of normal embryos, of from six to eight weeks. In the fifth week, the embryo measures from five to six lines. The amnion no longer surrounds the embryo, as a closely-fitting envelope, but forms a large vesicle, embracing at its anterior part, the pedicles of the allantois, and umbilical vesicle to form the cord. The development of the brain, and organs of sense, is much advanced; the fissures between the branchial arches are nearly closed up; the "vertebral incisures" are very distinct, particularly near the caudal or coccygeal extremity; the abdomen is closed in, excepting at the umbilical aperture, through which the intestine still passes, communicating with the umbilical vesicle, through its pedicle.

In *the sixth week* the embryo measures from seven to ten lines, and weighs from forty to seventy grains. The first points of ossification appear in the clavicle, and inferior maxillary; the ribs are observable, as narrow streaks on either side of the vertebral bodies; rudiments of muscles are sometimes distinguishable in the diaphragm, which looks like a membrane separating the thorax from the abdomen; a septum begins to divide the single ventricle of the heart into two; the pericardium is complete, the lungs may be seen as mere sacs, presenting traces of division into lobes, or vesicles, suspended from the trachea, like a delicate thread, having an enlargement at its upper part, where the larynx

is to form; the intestine extends into the umbilical cord, but beyond it the duct of the vesicle is obliterated, and may be traced only as a thread through the remainder of the cord.

In the seventh week the embryo is nine lines in length. The testicles and ovaries are first seen, also the urinary bladder, which is continued to the umbilicus by the urachus, at this time an open canal.

In the eighth week the embryo is from sixteen to eighteen lines in length, and from two to four drachms in weight. The clitoris or penis first appears like a small pea, and the anus, still imperforate, is marked by a dark point. The intestinal canal contracts within the abdomen. Osseous points are visible for the frontal and parietal bones. The chorion and amnion come into contact at the point where the villi of the former become greatly developed and condensed, to form the placenta. The umbilical vessels begin to twist.

The embryo of three months is from two, to two and a half inches long, and from an ounce to an ounce and a half in weight. By this time the rudiments of all the organs have been formed; the thymus, spleen, pancreas, salivary glands, muscles, nerves, internal parts of the ear, the ossa auditus, and pupillary membrane are all distinct; the dental sacs make their appearance in the lower and upper jaws; the mouth is closed, and is completely separated from the nostrils; the nose is very prominent; the fingers well separated from the extremities, and the extremities from the trunk; the integuments distinct, and the ventricles of the heart divided. The small intestines form several convolutions, and contain meconium, and the supra-renal capsules are much larger than the kidneys. "The most remarkable of the transformations that take place, perhaps, are those connected with the generative organs, for it is at this time that the rudiments of the germ-preparing parts are transformed into testicles or ovaria, and their excretory ducts become vasa deferentia, or Fallopian tubes; that the uterus detaches itself from the upper part of the sinus uro-genitalis (the future urinary bladder) and is more fully divided into cornua; and that the vagina is formed from the lower portion of the same uro-genital sinus; in the male the urethra is formed from the same uro-genital sinus. The external organs of generation have shown themselves so early as the second month, in the shape of projecting wart-like eminences, which, in the third month, acquire larger dimensions, as the clitoris or penis, underneath which, and in the middle line of the perinæum there is a cleft or channel, which is modified variously according to the sex. In the female the clitoris

continues backward in its formation to the beginning of the fourth month; the lateral parietes of the inferior open channel are formed into lesser labia; and in the vicinity of these the greater labia bye and bye appear as broad or more extensive tegumentary folds."* The membranæ deciduæ are in close contact, and the placenta is quite isolated. The umbilical vesicle, the allantois, and the omphalo-mesenteric vessels have collapsed. This I consider the conclusion of the third period; all the further changes which take place are merely transformations of the already developed rudiments; in the detail of them I shall very closely follow Devergie, as his description of the appearances which the fœtus presents, both intra-uterine and at birth, is the best with which I am acquainted.

Sect. IV.—*Fourth Period. From the complete formation of the Placenta until Birth.*

Fœtus of fourth month.—The length is from five to six inches, and the weight from two and a half to three and a half ounces. The skin is reddish and dense, and granulations of fat are visible under it. The mouth is large and open; the pupillary membrane is very distinct; the nails begin to appear, and the sex of the individual may be distinguished; there is meconium in the duodenum, and the sacrum presents points of ossification at its superior part. The umbilicus is situated near the pubes. The chorion and the amnion are in close contact all round.

Fœtus of fifth month.—Length seven to eight inches, weight five to seven ounces; the head very large compared with the rest of the body; the hair begins to appear; the nails are very distinct; the skin is covered with a sebaceous matter; the heart and kidneys are very large; the germs of the permanent teeth may be perceived; points of ossification may be seen in the pubes and calcaneum; and the meconium, of a greenish yellow tint, occupies the commencement of the large intestine.

Fœtus of sixth month.—Length from nine to ten inches, weight from a pound to a pound and a half; the eyelids are still closed, and the pupillary membrane still visible; the cord is inserted a little above the pubes; there is meconium in the large intestine, and the testicles are near the kidneys, and the sternum contains four points of ossification.

Fœtus of the seventh month.—The length is from eleven to

* Wagner's Physiology, trans. by Willis, Part ii. p. 177.

thirteen inches, and the weight from three to four pounds. The skin is reddish, fibrous, and thick; the nails do not yet reach the extremities of the fingers; the eyelids are no longer closed, and the pupillary membrane is less apparent; there is a point of ossification in the astragalus; the meconium occupies nearly the whole of the large intestines; valvulæ conniventes may be perceived in the digestive canal, and the cœcum is placed in the right iliac fossa; the left lobe of the liver is almost as large as the right lobe; the gall-bladder contains bile; the brain possesses firmer consistence; the testicles are farther removed from the kidneys.

Fœtus of the eighth month.—The length is from fourteen to sixteen inches, and the weight from four to five pounds; the skin is thickly covered with sebaceous matter; the nails reach the extremities of the fingers; the pupillary membrane commences to disappear towards the end of this month; there is a point of ossification in the last vertebra of the sacrum; the cartilage which forms the inferior extremity of the sacrum does not present any osseous point; the brain shows the appearance of convolutions, but the white matter does not yet exist; the testicles are engaged in the abdominal rings.

Fœtus of nine months.—The length is from eighteen to twenty-two inches, the weight differs very much, and has been known to vary from two to fifteen pounds, but the average is about six pounds and a quarter; the central point of the body is found to vary from seven and a half, to ten lines above the umbilicus, and not to be situated exactly at the umbilicus, as is stated in many works; the head is covered with hair in a greater or less quantity, and the skin is coated with a whitish sebaceous deposit, which is remarkably abundant in the axilla, the folds of the groins, and of the nates; the pupillary membrane no longer exists; the external auditory canal is entirely cartilaginous; the four portions of the occipital bone are still distinct; the hyoid bone is not ossified; there is a point of ossification in the cartilage of the inferior extremity of the femur, and this is the only long bone which has a point of ossification in its epiphyses; the brain presents some appearance of white matter; the liver descends to the umbilicus; the testicles have passed through the inguinal canals, and may be found in the scrotum; the meconium occupies the end of the large intestine.

Although in going over this subject, I have stated the weight and measurement of the fœtus at each particular period, yet it is proper to be aware that it varies very much not only in different women at the same periods of

pregnancy, but even in the same woman in her different gestations. As already mentioned, there is great variety in the size of the fœtus of nine months, of different females, and even of the same woman. The size of a child does not depend on that of his parents, for a diminutive pair often procreate children which are large at birth, although when grown up to maturity, they may resemble their parents in their diminutive size; nor are the children of tall persons proportioned at birth to the stature of their parents. It may be remarked, that females who take regular exercise, who do not indulge in stimulating diet, cordials, or luxurious living, and above all, those who are not of an anxious disposition, generally produce large and vigorous children. Male children are generally larger than female children; when there are more than one fœtus in utero, the weight of each individual fœtus is less than that of a fœtus not a twin, but the sum of the weight of the two, exceeds that of a unigenite fœtus. When a woman produces twins, the first which is born is generally the larger. The average weight of a male at the full time, is from 6 to 8 pounds; of a female, from 5 to 7. Baudelocque met with two instances, where the fœtus weighed at birth $9\frac{3}{4}$ pounds; there is one in the museum of Copenhagen, which weighs 15 pounds, and I have myself seen a new born fœtus weigh $12\frac{1}{2}$ pounds. The uncertainty of the date of conception, as well as the great variety in the weight and measurement of children, render us unable to determine their age accurately, from these data.

Sect. V.—*The Umbilical Vesicle.*

Being unwilling to interrupt a continuous account of Embryonic development, the proper description of the organ is introduced at this place. From what has been already said, it will be understood, that the umbilical vesicle is the yolk sac; that it is proportionably very large in the youngest embryos, "that it rests immediately upon the intestine, and communicates with its cavity. At a very early period it becomes pedunculated; its neck is produced into a canal, which is hollow at first, so that its contents can be pressed backward and forward, to and from the intestine." This communication soon becomes impervious, and by the end of the first month it is filiform; and by the conclusion of the second month it can be traced only as a fine thread running through the umbilical cord, as far as the end of the noose of intestine contained in it; the vesicle itself collapses more and more, and may be discovered in the placenta of the full

time, as a shrunk sac lying between the chorion and amnion. It contains a fluid of a yellowish white tint, displaying numerous oil globules; sometimes the fluid is of a yolk yellow. The structure of this vesicle has lately been investigated with great care by Mr Grainger; and according to his observations, when examined in the chick in the early days of incubation, "the inner surface of the umbilical vesicle, composed as it appears of a highly organised mucous membrane, presents a surface uniformly extended, with no folds or inequalities perceptible to the naked eye, except those caused by its blood vessels, which are most abundant." Subsequently an immense number of folds or valves are produced, these become gradually more developed, and more crowded as the vesicle diminishes in size; they are covered with a coating of greyish white corpuscles, and hence the vessels contained in them received from Haller the term *vasa lutea;* these corpuscles, however, may be washed away, and then the vessels do not differ in appearance from what is usual: they are extremely contorted and convoluted in their course, and form the capillaries of the omphalo-mesenteric vessels. Dr Sharpey states, that " on tracing back the fine pedicle of the umbilical vesicle towards the fœtus, it was seen, on approaching the intestine, to consist of two filaments, which were separated by the coil of intestine. After a nice dissection, one of these was traced back to the small intestine in the abdomen, which it joined almost immediately below the stomach, enlarging somewhat at the point of its junction. This seems to be the omphalo-mesenteric vein. The other filament, (the omphalo-mesenteric artery) after a nice dissection was found to proceed from the mesenteric vessels."

The function of the umbilical vesicle is thought to consist in affording its contents as nourishment to the embryo, during the first period of its existence; it is however disputed through what passage the nutritious matter is conveyed to the embryo, whether through the vitelline duct directly into the intestinal canal, or whether it is taken up by the vasa lutea, and carried along the omphalo-meseraic vein. Mr Grainger believes himself warranted in adopting the latter view, for the following reasons. 1*st*, Because in the chick, the vasa lutea become more and more developed, until at the end of incubation they cover the whole yolk. 2*dly*, These vessels persist much longer than the vitelline duct, which very early becomes impervious. 3*dly*, The action of the vasa lutea continues until the whole process of development, so far as the egg is concerned, has come to a conclusion. And, 4*thly*, Because the new nutritive compound formed by the union of the

yolk and albumen, always accumulates at that part of the vesicle, which lodges the vasa lutea.

Sect. VI.—*Structure and Functions of the Allantois.*

The development of this organ having been already described, I have now merely to mention its structure and functions. It is only very lately, that by the researches of Von Baer and Rathke, an allantois has been proved to exist in the human ovum. It forms a delicate membranous bag, communicating with the lower end of the intestine; it lies between the chorion and amnion, and some suppose, that it is in it, that the *false or spurious waters* are contained, and have therefore termed them the *liquor allantoidis;* it is composed of two laminæ, an outer or vascular, and an inner or mucous layer; by the former of these it is attached to the chorion. It was supposed at one time to aid in nourishing the embryo, it is now however thought probable that it effects some change on the blood of the embryo of the chick, similar to that effected for the fœtus of the mammalia by the placenta. The distribution of the vessels of the allantois has been attentively examined by Mr Dalrymple, and he states, " the arrangement of the vessels, at the bottom of the pulmonary cells of the frog, with the single exception of the larger size of the capillaries, presents so complete a similitude, as to justify us in considering the type of the vessels of the allantois to be strictly pulmonary, and is a further confirmation of the so much disputed respiratory functions of this membrane in the bird.

Sect. VII.—*The Fœtal Circulation.*

I have already stated, that the omphalo-meseraic are the first blood-vessels developed, that the vena porta is formed by them, and the heart first appears as a dilatation of this latter vessel: this enlargement is irregular, and consists of three smaller dilatations, separated by two contractions; two of these constitute one atrium, composed of an auricle and ventricle; and the third the *bulbus arteriosus*,—the rudiment of the aorta. According to Mr Ollivier, the pulsations of the heart have been recognised, as early as the fifth week, at the upper part of the left side of the abdomen; the circulating fluid is at this time still colourless; in the seventh week the aorta is the only existing artery, after it the pulmonary artery appears, but does not divide until the eighth week, when it sends a branch to each lung; about this time, or soon

after, the single ventricle has become divided into two by a complete septum; the auricle is also divided, but its septum is not complete throughout the whole of fœtal life, as there exists in it an opening, termed the *foramen ovale;* the presence of this opening, and that of a canal, affording a communication between the aorta and pulmonary artery, form the chief peculiarities in the fœtal circulatory organs.

In describing the fœtal circulation, it is best to commence at the aorta. This vessel divides in the fœtus, as in the adult, opposite the lumbar vertebræ, into two branches,—the common iliac; and these again into two others,—the external, and internal iliac; these two latter vessels are continued into the umbilical arteries; by some the umbilical are considered branches of the internal iliac; they are generally believed to have been originally the arteries of the allantois, and as this organ rises and passes out at the umbilicus, it carries these vessels with it; in the mature fœtus, they ascend along the sides of the urinary bladder, pass upwards with the urachus, out at the umbilicus, and then along the cord to the placenta, thus carrying the blood from the aorta of the fœtus to that organ, which it fills like a sponge. From the ramifications of these arteries, the blood is conveyed, as already described, into the minute branches which give origin to the umbilical vein, and by means of this vessel, it is again returned to the fœtus through the umbilicus; this vein, which ultimately becomes the round ligament of the liver, ascends towards that organ, passes along the anterior margin of the suspensory ligament, and supplies the left lobe of the liver with blood; it gives a branch to the vena porta, which supplies the right, and then passes directly by the *ductus venosus* into the vena cava ascendens, which likewise receives, by the hepatic vein, the blood from the placenta and abdominal viscera distributed to the liver. This blood is carried, by the vena cava ascendens, to the right auricle, which also receives the blood brought to it from the jugular and subclavian veins, by the vena cava descendens; as the right auricle contracts, it forces its contents partly into the right ventricle, and partly through the foramen ovale into the left auricle; regurgitation from the right ventricle is prevented by the tricuspid valve,—this ventricle contracts, and forces its contents into the pulmonary artery; very little blood, however, passes along this vessel, as almost the greater part of it is carried away by the ductus arteriosus into the aorta; regurgitation from the pulmonary artery is prevented by the semilunar valves. The blood which passed from the right into the left auricle, directly through the foramen ovale, is propelled from the latter

cavity into the left ventricle; its regurgitation from which is prevented by the mitral valve; and by the contraction of the left ventricle, its contents are driven into the aorta, from whence its regurgitation is prevented by the semilunar valves; and by the various branches of this vessel, it is distributed over the whole body, and again carried to the placenta; the auricles contract first, at the same moment, and then the ventricles also simultaneously.

It is still disputed, whether any blood is circulated through the lungs in the pulmonary artery. As the only use of the blood being circulated through the pulmonary vessels of the adult, is to enable the atmospheric air to effect upon it certain changes which are not required, and do not take place in the fœtus in utero, we may surely conclude, that no more blood is circulated through the lungs than is sufficient for their nourishment. During fœtal life, the lungs perform no function, but are seen, as small, comparatively dense, and collapsed bodies, lying on the spinal column.

Some physiologists maintain, that the blood brought into the right auricle, by the venæ cavæ, does not intermingle, 1*stly*, Because the vena cava descendens terminates exactly opposite the ventricular orifice, and thereby transmission of blood from it, through that opening, is favoured. 2*dly*, Because the mouth of the vena cava ascendens is covered by the Eustachian valve, which, in the fœtus, is very large, and by means of it the flow of blood from that vessel is directed through the foramen ovale. It is, however, scarcely possible to conceive, that two streams of fluid can be poured into a cavity, and again, and at the same moment, ejected from that cavity, by a muscular contraction of its walls, without intermixture taking place. It was imagined that this doctrine was substantiated by the following experiment. An injection pipe was placed in the jugular vein of a fœtus of the sixth month, and another in the umbilical vein; by syringes, different coloured injections were forced through these, at the same moment, and it was found, that the one from the jugular passed into the right ventricle, and the other from the umbilical vein, through the foramen ovale, with scarcely any intermixture. This experiment, however, is open to a palpable fallacy; the auricle upon which it was made was dead;—had it contracted upon the injected fluids, and had they been thus forced into their respective cavities, the result would have been very different.

The physiologists who entertain this hypothesis imagine, that the rapid development of the brain may be thus accounted for; that a more direct passage is given to the

blood from the placenta to the brain, and that this organ is thus supplied with a purer blood; but they appear to overlook the fact, that of the same blood which is brought through the umbilical vein, the vena cava, the right auricle, the left auricle, the left ventricle, the aorta and its branches, to the brain, a part must also descend the thoracic aorta, and be distributed to the other parts of the body. The blood in the ascending cava cannot be purer than that in the descending cava, since it is mixed in the former with the blood which has circulated through the sacral extremities, the lower parts of the body, and the abdominal viscera. To make up for the deficiency of the fœtal heart in muscular power, we observe, that the united strength of both ventricles is exerted to force forward a column of blood into the aorta, and is not divided to act upon two columns, one for the systemic, and another for the pulmonic circulation. As only a small portion of blood can reach the left side of the heart by traversing the lungs, the foramen ovale and the ductus arteriosus are evidently intended to facilitate its transit from the right to the left side, and especially the ductus arteriosus, because as both auricles contract at the same moment, but a small quantity comparatively can pass through the foramen ovale.

In the previous parts of this chapter, I have frequently alluded to certain changes effected on the fœtal blood by the allantois and the placenta, analogous to those which in the adult are the result of respiration. Some writers describe the respiration of the embryo and fœtus; when they assert that they have *seen* it, we understand what they mean, and that it is only certain *muscular motions*, resembling those of respiration, to which they allude. The following is the description of those given by Béclard, which I have been able to verify on two separate occasions, once in a fœtus of four months, and again in another of six months. He saw "through the liquor amnii, and its enveloping membrane, respiratory movements, consisting in an opening of the mouth, enlargement of the nostrils, and a simultaneous elevation of the walls of the thorax;—these movements repeated at equal intervals, and generally slower than the movements of extra-uterine respiration." In support of this observation, it was asserted that the liquor amnii contained air, and thus served the function of respiration; but in all his experiments except one, Müller failed in obtaining any gas from the liquor amnii, and in that instance it formed only $\frac{1}{156}$th part of the bulk of the fluid. Again, fish die as soon in the liquor amnii as in oil; and if it does contain gas, it is neither oxygen nor car-

bonic acid.* It was also affirmed, that the embryo respired by means of the branchial arches; but nothing can be more erroneous than the supposition that they possess any analogy to the gills of the fish. In discussing the function of the allantois, I stated that it was believed to aerate the blood of the embryo; and I mentioned also the grounds on which this conclusion was founded. The function which in mammalia replaces the respiration of the ova of other animals must be a very peculiar process; in them there is no respiration, properly so called, but some change, as yet unknown, is effected on the blood, in the placenta. The fœtal blood contained in the villi of the placenta is brought into nearly the same contiguity with the maternal blood that the blood in the lungs of the adult is with the atmospheric air. Some have denied that any change takes place, or that there is any difference in colour between the blood carried to the placenta by the umbilical arteries, and returned by the vein, but any one may certify himself of this, as I have frequently done, by a very simple experiment. On the birth of the fœtus, before the cord is divided, a portion of it is to be included between two ligatures, and first one of the arteries punctured, and then the vein,—the blood in the former will be observed to be of a modena colour, and the latter scarlet. The blood of the artery becomes florid on exposure to air, this Müller says he has frequently observed; but it may perhaps take place more slowly than in venous blood. The blood of the fœtus coagulates less firmly than that of the adult, and is said to be destitute of phosphoric salts, and its globules are larger than those in the blood of the adult.

Sect. VIII.—*Comparative frequency of multiplicate to single Births.*

The proportion of plural to single births varies not only in different countries, but even in different parts of the same kingdom. Thus, for example, there have been twins born in some of the public institutions in London once in 80 or 91 deliveries; in Glasgow, once in 95; in my practice once in 98; and at the Dublin Lying-in Hospital once in 58. M. Tenon of Paris published, many years since, a report of 104,591 births, and the proportion of twins was 1 in 96. The calculations from various parts of Germany state twins to happen in the proportion of from 1 in 65 to 1 in 70 births.† In the Prussian dominions there is on an average a case of

* Müller, Trans. by Baly, vol. i. p. 320. † F. N. Phil. Trans., Lond. 1827.

twins to every 87 births; and in the Midwifery Institution at Vienna, from July 1839 to July 1840, to 5068 single births, there were 5 twin cases.

The author has repeatedly had occasion to know, that where a mother has produced twins, some of her family has also had multiplicate births. And from various sources of information it would appear that some males have been remarkably gifted with the power of procreating plural births. A gentleman, who was a pupil of my class some years ago, assured me that in the district of Ireland to which he belonged, an individual resided who had twins produced to him by his own wife, and by each of four other women, during the same year. Paré relates that the lady of a nobleman, near Chambellay, produced twins the first year of her marriage; triplets the second; quadruplets the third; quintuplets the fourth; and sextuplets the fifth year, of which last number one only survived, and inherited his father's titles and property. After this last birth the mother died.* Gottlob relates a case in which a woman at three births produced eleven children.† In 1755 a Muscovite was introduced to the Empress of Russia, whose wife at each of four different deliveries produced four children.‡ Some years afterwards two other native Russians were presented to another empress; and the wife of one of these produced four children at a birth on four different occasions; three at a birth seven different times; and twins six times. The first wife of the second Russian was delivered of four at a birth, four different times; three at a birth seven times; and twins sixteen times; and this woman having died, the husband married again, and the second wife produced triplets twice, and twins six times. To these illustrations I may add that of a French woman who produced triplets three times in succession; and her husband being desirous of ascertaining whether his wife or himself was the principal agent in these births, he seduced his servant maid, who also produced triplets.‖ Osiander relates several cases showing that females may be endowed with the same power; one of these, who produced thirty-two children at eleven births, was herself a triplet; and her mother had thirty-eight children; another woman was delivered of five at a birth, and her sister of three.

Triplets are comparatively rare in all countries. In the Dublin Lying-in Hospital such births have happened once in 5050 cases; the proportion has been nearly the same in my

* Paré, p. 971. Burdach Physiol., V. 2, p. 117.
† Mém. de L'Acad. des Sci., V. 2, p. 275.
‡ Diction. des Sci. Méd., V. 19, p. 389. ‖ Lond. Med. Surg. Journ. 1833.

practice; in France about once in 7000 deliveries; in the Prussian dominions once in 7042 births, or 871 triplets to 6,067,200 single births; and at the Midwifery Institution of Vienna, to 31,239 single births, from 1789 to 1822, there were six triplet cases. Haller conjectured that four at a birth did not happen, on an average, oftener than once in 20,000 deliveries; while Dr Garthshire estimated their frequency in the proportion of one in 100,000 cases, which is, perhaps, more correct. From 1826 to 1837 there were 15 deliveries of four, to 6,067,200 single births, in the Prussian dominions; but in the town of Berlin there was not a case of four during the above period. In the volume of the Philosophical Transactions already quoted in this section, we have a considerable number of well attested quadruplet births recorded. There are also in the work referred to five satisfactorily attested cases of five children born at one birth, some of them continuing to live for a short space of time.

From Dr Osborne's writings a case of abortion is quoted by Dr Conquest, in which six embryos were produced at once. The following account, however, of six fœtus at one birth, will be read with interest. It will be observed that it has been copied from a newspaper, but the author has been assured by Dr Charles Binny, a respectable member of the profession, and who returned from the colony in 1841, that the editor of the paper in question is incapable of introducing any thing except what he knows to be authentic. "A woman of the name of Ferrers, living in the district of the Grange, was brought to bed, on the 3d of July last, of six children at one birth, a circumstance, we suppose, unparallelled in the records of medical history. The mother is wife to an honest and industrious man, following the labours of splitter and fencer. She is rather a small woman than otherwise, and professes to have felt no more inconvenience previous to confinement than in ordinary cases. She has been a mother twice before. Her height is five feet four inches, fair complexion, and freckled, light blue eyes, brown hair, and an intelligent expression of face. She is Irish by birth, came out in one of Marshall's vessels, and is 26 years of age. The only remarkable symptom she experienced was in the growth of inordinate appetite, her husband having been obliged to purchase an extra ration for her use during pregnancy. She was first taken ill on the 1st of July, had several pains during that and the following day, and was in labour sixteen hours. The children are, or rather were, all girls; one, however, the first, was still-born, and two died afterwards. Fortunately, the poor woman had

several female acquaintances, who took care of the little strangers, and consoled her under the prospects of starvation that attended their first appearance. She is now suckling two herself, while her eldest girl feeds and nurses the third. They are remarkably thriving, and the mother, recovered from the fright and wonder attendant upon so extraordinary a birth, is getting quite proud of her offspring. During the period of labour she was fed at intervals with a tea-spoonful of hot brandy and water, having in that distant part of the country no other luxury or remedy whatsoever to resort to." *Port Philip Gazette, August* 28, 1841.

Paré refers to Pliny, Cromerus, Mirandula, and Albucasis, for instances in which seven, ten, eleven, twelve, fifteen, and even thirty-five embryos were produced at once; but these cases are all too marvellous to deserve comment.

Of the circumstances, on the part of the male, which may lead to the production of multiplicate births, we know little; nor can we, on this obscure point, advance much in regard to the female, beyond conjecture. It is probable, that when there are several Graafian vesicles in a condition to be fecundated, plural fœtus will be produced, according to the number of vesicles which are thus prepared. And as it must be observed that the middle and humbler classes are more prolific than the higher ranks of society, and that extraordinary cases of multiplicate birth have been almost entirely confined to them, it is an obvious inference that a life free from luxuries and dissipation is favourable to the propagation of our race.

As in one of the instances related in the Phil. Trans. of three at a birth, the father was paralytic over one half of his body for two years previously, and that in the case of five, the father was in a confirmed state of phthisis for some time before this extraordinary delivery; and that both these men were consequently incapable of sexual intercourse except at considerable intervals, it may be presumed, when several infants are produced at once, that the Graafian vesicles are simultaneously fecundated, and not by successive seminal applications.

Sect. IX.—*Position of the Fœtus in Utero.*

The ancients supposed, and some of the moderns coincided in the opinion, that when the fœtus was received in utero, it assumed a sedentary position till the sixth or seventh month; when, for want of accommodation, or some other cause, so complete a change took place in its attitude, that the head occupied the situation of the nates; which was

termed turning to the breech. They maintained that if it were to continue in its original position, it would be liable to apoplexy. These notions could only pass current until the prejudices against dissection were modified; when it was observed, that in thirty of thirty-one cases, the head gravitated from the time the fœtus became visible.

In the most natural position, the fœtus describes an oval body, which is situated obliquely in relation to the abdomen. The vertex constitutes one extremity of this oval, and the nates the other; one margin is formed by the incurvated spine, and the opposite by the extremities in a state of decussation. The head is raised and the chin pressed towards the upper part of the thorax; the knees are drawn up to the scorbiculus cordis; the legs are bent upon the back part of the thighs, and decussate each other; and the arms are placed between the chin and the knees. Though this be the usual attitude of the fœtus in uniparous pregnancies, yet several varieties present themselves. Sometimes a hand, or a foot even, may be placed over the ear.

In twin cases it is the general belief, that most frequently the head of the one is placed towards the breech or feet of the other. In ten twin cases of which an accurate record has been preserved in our practice, the following were the positions in which the fœtus passed through the pelvis: In one delivery both presented the breech; in two the head and breech; in three, the head and feet; and in four, the head. Of these twenty fœtus, four only were females. In two triplet deliveries which occurred under the management of my pupils, in each, the two fœtus which were first born presented the head; and the third in both cases, the feet.

Whatever attitude the embryo at first assumes in utero, the reader need scarcely be informed that the capacity of this organ is such as to afford it but little freedom for change of position, and that this facility becomes daily less as the length of the fœtus increases. A change is more apt to happen in the early than latter months, not only from the embryo being smaller, but there being a larger proportion of liquor amnii. Some very extraordinary changes have taken place in the position of the fœtus during parturition. Baudelocque* relates a case where, during labour, the head, feet, back, shoulders, and one of the sides, presented in succession; and at the instant the membranes burst, the belly, knees, and a loop of the funis were felt. These evolutions must be favoured by the diminutive size of the fœtus; a profusion of

* Vol. i. p. 264.

liquor amnii, and irregular action of the uterine fibres. In premature labours, in consequence of the death of the fœtus, we often find presentations of the feet or breech, brought about in all probability by its dying struggles, and its small size favouring the change of position. I have rarely found much liquor amnii at the full time, where the fœtus was alive, and the breech presented; which has induced me to think, that were this fluid always abundant, we should rarely meet with such presentations, as the head by its own weight would gravitate. Another reason for the head being generally found in a dependent posture is, that the funis is inserted into the body nearer its pelvic than cephalic extremity, whence it is unequally balanced.

CHAPTER XIII.

SUPERFŒTATION.

By this term is to be understood the fecundation and development of an additional ovulum in a woman not only already pregnant, but after that function has made some progress. The circumstances which have given rise to, and tended, from time to time, to support the idea of superfœtation, are females in plural deliveries, producing infants of different sizes, various colours, and within a few weeks or months of each other. The ancients, generally, were converts to this opinion, and some of the moderns agree with them;* but, in the present state of our knowledge, I am at a loss to comprehend, how any one acquainted with the changes induced in the uterus by conception, and what is known regarding the physiology of that function, can admit such a doctrine, except under certain limitations. Until the deciduous membrane is formed, and the os uteri sealed, semen may be conveyed into the recesses of the procreative system, and a second ovulum become vivified; but we know not how soon after sexual communication these incipient stages are completed: it has been already stated, that the earliest period at which this production has been found in

* In the human subject, only one ovum is generally impregnated by one seminal application, but sometimes two or more may be carried down into the uterus, and even after one ovum has reached the uterus, and grown to a certain degree within it, we find, that it is possible for a second to be excited into action, and brought down into the womb, where it is nourished and supported. Burns, Art. *Conception*.

utero, is the eighth day. Superfœtation is also possible in a woman furnished with a double uterus; and likewise, during the retention of an extra-uterine fœtus. In the female of the lower animals, we know, that when the channels leading to or from the uterus are rendered impervious, the procreative function is suspended; and it is probable, when similar defects exist in the female of our own race, that the result is the same. Upon these grounds, superfœtation, except under the conditions stated, is incompatible with the changes produced by pregnancy in the human subject. Were it otherwise, I presume it would not be a very rare occurrence to hear of females bringing forth monthly, or oftener, during their menstrual life, according to the date of each conception.

The appearances alluded to, and in which this doctrine has had its origin, may all, even the most formidable of them, be more scientifically explained. There are many causes which may retard the growth of one of several fœtus produced at a birth, without affecting the whole. It is probable, from the discrepancy which may be observed in the observations of eminent writers regarding the earliest period at which the product of conception has been found in utero in different females, that the time of its tranference from the ovaries is not uniform; and that there are circumstances which may interfere with its growth before, as well as after it has left its original *nidus*. Its development in utero may be affected by diseases of the placenta, or of the funis, or of both at the same time; by one of the cords being so compressed as to prevent the corresponding fœtus fully enjoying the functions of its placenta; by partial or total detachment of that mass; and one of the progeny may appear much smaller than the other, from original dwarfish formation—the result of some morbid state of the placenta. When the fœtus is much contaminated with syphilis, it is generally small at birth. In a woman who produced male twins in my practice, the first born appeared to have been dead some time from syphilis, while the second was alive and healthy and continued so for a month, when the disease also exhibited itself in it. In my collection are two fœtus, apparently of the fourth month, expelled with a healthy living one of the full time; the parents, in both instances, while in the close of the fourth month, met with an accident which was succeeded by slight effusion of blood per vaginam; but, by judicious management, abortion was prevented. The nature of these cases is obvious; the mothers must have conceived of twins, and the placenta of one of them in both instances

been separated by the accident, which led to the suppressed development and destruction of the fœtus. Such cases are of frequent occurrence, and were, at one time, considered examples of superfœtation. I have also among my collection an ovum the size of a Florence flask, obtained from a woman who thought herself in the seventh month of pregnancy. The umbilical veins are extremely varicose, and the fœtus is only the size of a bee.* In my possession there is another fœtus apparently of the fourth month, which had remained in utero however for nine months, and whose development appears to have been retarded by a diseased state of the placenta and funis. Repeatedly during its retention, there were threatenings of abortion, such as pelvic uneasiness and trifling sanguineous discharges.

The production of fœtus of different colours, is easily explained. The oldest upon record is by M. Buffon, in which a woman at Charleston, South Carolina, in the United States, produced, in 1714, a black and a white child, at one birth. This remarkable occurrence led to an investigation, which the woman herself satisfactortly explained by acknowledging, that one morning after the departure of her husband, the black valet entered her bed-room, and menaced her with instant destruction unless she submitted to his embraces. To say the least of this case, it is carelessly drawn out, for the coloured infant should have been a mulatto and not a negro. But Dr Mosely relates an example, which, as it is somewhat similar to the foregoing, and seems perfectly accurate, may be mentioned here; it occurred within his own time at Shortwood estate, island of Jamaica. A negro woman produced two infants at one birth, the one of the same shade with its mother, and the other a mulatto. On inquiry as to their want of resemblance, the parent replied that she was perfectly aware of the cause; for that one morning, almost immediately after her sable husband had quitted her, she received the embraces of a white man who came to her hut. These cases cannot be viewed as examples of superfœtation, but rather as instances of contemporaneous conception.† For we may naturally suppose, that

* Ruysh a vu la femme d'un chirurgien d'Amsterdam accoucher, à dix heures d'intervalles, d'un enfant plein de vie, et d'un embryon, dont le cordon étoit rempli d'hydatides, et qui ne pouvoit pas avoir plus de trois mois. Velpeau, vol. i. p. 330.

† Une negresse de la Guadaloupe mit au monde deux garçons á terme, l'un noir, l'autre mulatre, et convint qu'un même soir elle avoit eu commerce avec un noir et avec un blanc. Une autre negresse accoucha de trois enfans, un noir, un blanc, et un *cabre*. Une domestique blanche, dans le compté de Montgomery, mit au monde, de la même couche, une fille blanche et un garçon par-

when a female submits to the caresses of two males, the one shortly after the other, if two ovula be animated and brought to maturity, each fœtus will resemble his respective sire. In further support of this position, it is scarcely necessary to refer the reader to what may be observed among the canine tribe.*

The explanation of cases in which fœtus have been expelled at intervals of weeks, or several months, of each other, would seem more difficult. Of these, the most extraordinary are rather of recent date. The first is one by Dr Desgranges, of Lyons. The wife of M. Raymond Villars of that city, married at twenty-two, became pregnant five years afterwards, and on the 20th May 1779, was delivered in the seventh month. In a month from this time she conceived again, and seven months from the supposed date of this second conception, she brought forth a living child. This delivery, however, was not followed by the usual changes, such as the milk, lochia, and diminution of the abdomen. Two surgeons visited her, but being unable to account for these circumstances, they called Dr Desgranges into consultation; and he gave it as his opinion that there was another fœtus in utero. Three weeks after this delivery, the movement of the child confirmed the decision of Dr Desgranges; and five months and sixteen days after the birth of this infant, Madame Villars produced another living daughter. The milk was now secreted, and the mother enabled to nurse. Dr Desgranges adds, that it was impossible this infant could

faitement noir; un negre et un domestique blanc disparurent ensemble lorsqu'on eut reconnu que cette fille etoit enceinte. Velpeau, p. 333. Dr Elliotson, in the second edition of his translation of Blumenbach's Physiology, p. 33, relates the case of a white woman, who produced a coloured and a white child at a birth.

* Au dire de M. Gardien, M. Valentin a rapporté un fait semblable au precedent. Une jument mit bas, à un quart-d'heure de distance, un poulain et un mulet; elle avoit été saillie d'abord par un cheval, et cinq jours après par un âne. Velpeau, vol. i. p. 333.

Une chienne de très-grande race, et venant du mont Saint-Bernard, avait été couverte successivement par un chien de chasse ordinaire et par un chien de la race de Terre-Neuve. Elle mit bas en Mai 1824, jusqu'a onze petits qui presentoient les caractères suivans; six d'entre eux se trouvoient semblables au chien de chasse; cinque au contraire au chien de Terre-Neuve. Ces animaux differoient ainsi tellement entre eux, qu'on auroit cru difficilement qu'ils fussent nés de la même mère et dans la même portée: les jeunes chiens de Terre-Neuve étoient en effet d'une couleur toute differente des premiers, et d'une taille presque double de la leur. Aucun d'eux n'avoit d'ailleurs de rapport de coloration avec la mère; et il n'y avoit point à cet égard à s'y meprendre, celle-ci etant très—remarquable par de belles taches jaunes repandue sur un fond blanc. Les cinq jeunes chiens de Terre-Neuve se trouvoient tous du sexe mâle, et les autres, au contraire, du sexe femelle. Annales de Sciences Naturelles, vol. xi. p. 441.

have been procreated after the expulsion of the first "car le mari n'avoit renouvelé ses caresses á sa femme que vingts jours aprés, ce qui n'auroit donné au second enfant que quatre mois vingt-sept jours." This case is accompanied by a legal attestation of it; and on the 19th January 1792, both these children were alive.*

The next case is by Dr Maton. Mrs T. an Italian lady married to an English gentleman attached to the commissariat of the British army in Sicily, was delivered on the 12th of Nov. 1807 of a male child, which had every appearance of health. The lady was confined under very painful circumstances, the child having been expelled among a quantity of straw at midnight in an uninhabited apartment, and it lived only nine days. On the 2d of February 1808, rather better than two months and a half afterwards, Mrs T. was delivered of another male infant completely formed, and apparently in good health. When about three months old, this child fell a victim to measles.†

Mad. Villard's case, we may conclude, has either been misstated, or that this individual possessed a double uterus, which latter is the most probable inference.‡ We are first told that she was impregnated a month after her first premature birth; but this is very improbable, supposing that

* Dict. des Scien. Med. v. liii. p. 418. M. Velpeau, in his Elements of Midwifery, relates the case of a Mad. Bigaud, who, on the 30th April 1748, produced a living male child, and on the 17th September following, another infant, which was also living and lively. He quotes the Recueil de la Société de Medicine, for the case of a woman named Arles, who, in 1796, gave birth to a child at the full time, and five months afterwards to another, which also was thought to be at the full time. An opportunity was afforded in 1755, according to the author of this article in the Dict. des Sci. Med., of examining the body of Bigaud, who was found to have but a single uterus. The first of the two children was small and delicate, and lived but two months and a half; while the second was stronger and more plump, and survived a year and a day. Bigaud's first child, admitting that the case is correctly stated, must have been born about the middle of the seventh month, and the birth of the second protracted about two months beyond the natural term. And as to the case of Arles, unless we admit the presence of a double uterus, it is unworthy of belief.

† Transac. Coll. Phys. Lond. vol. iv. p. 161.

‡ Lobstein, in the Med. Phys. Jour. Lond., states, that he delivered a woman of two infants, one a month after the other; and was able to convince himself that she had two uteri, and to each a distinct vagina. Dr Purcell in examining the body of a woman, discovered that she had a double uterus, in one of which he found a fœtus. There was but a single tube and ovary to each uterus. Phil. Trans. Lond. vol. xiii. p. 572. Abridged Edit. Dr Norton delivered a woman of a black fœtus of the eighth month, and of a white one of the fourth month. Having attempted to extract the placenta of the first before the second was born, he discovered a passage so narrow that it would not admit his hand; so that this woman must have possessed a double uterus, and to each a vagina. Lond. Med. Chir. Rev. June 1, 1824. There is a preparation of double uterus in the museum of Prof. Rokitanski at Vienna, and each uterus presents the appearance of having been at one time pregnant.

she had but a single uterus; for we could scarcely expect that the organ would be so early restored to its healthy condition, as to have enabled this lady to conceive in such rapid succession. In my researches I know of but one instance of a woman conceiving in so short a period as a month after previous delivery.* If we do not admit the presence of a double uterus, there is another part of Mad. Villard's case which is, to say the least, a little doubtful, viz. that the first of these twin infants was reared though *born in the seventh month.* But admitting that all the circumstances are correctly stated, they cannot be explained in any way so satisfactorily as by supposing, *first*, that Mad. V. had a double uterus; *secondly*, that her *second child* was procreated in the adventitious womb; and, *thirdly*, that her third infant was developed in the uterus which contained *her first birth.*

The case of Mrs T. though not so minutely detailed by Dr Maton as its extraordinary nature deserved, may be satisfactorily accounted for without the supposition either of a double uterus or superfœtation even. This lady must have conceived of twins, and one of them, it would appear, was expelled at the close of the seventh, or early part of the eighth month; while the other was retained for the natural term, allowing nine months and two or three weeks as the period required in very many instances for human pregnancy.†

There are many cases recorded which prove that a female may be impregnated during the retention of an extra-uterine fœtus.‡ One or other of the explanations which have been offered in the foregoing observations would account for the case to which Professor Burns refers in support of his belief in superfœtation.§ Should the legitimacy of infants born

* Author's Memoir on Extra-uterine Gest. p. 46.

† Sacchias, among his *Consilia*, relates a case where a widow, eight months after the death of her husband, was delivered of a deformed fœtus, which died during labour. The woman's abdomen continuing large, it was suspected to contain a second child, but all efforts to procure its expulsion proved unavailing, until one month and a day afterwards, when labour supervened, and a healthy living infant was produced. Une dame de Turin dont le nom m'est connu, demeurant dans la rue neuve, accoucha successivement en 1797, de trois enfans, à quinze jours de distance l'un de l'autre. Foderè, vol. i. p. 484. In the summer of 1820, the particulars of a case were communicated to the author by a pupil, where a soldier's wife was delivered of one child at Kilmarnock. After remaining four days at this place, she went on foot to join her husband in Ayr barracks, where, ten days afterwards, she was delivered of another child. All periodical works abound with cases of this character. Mad. Boivin, in her work on Midwifery, mentions the case of a woman, who, on the 15th of March, was delivered of a daughter, and on the 12th May of a second. Velpeau.

‡ Diction. des Scien. Med. v. xix. p. 409. See Author's Memoir on Extra-uterine Gest. p. 131.

§ Lond. Med. Physic. Jour. xvii. Review of Dr Dewees on Superfœtation, p. 498.

under circumstances resembling the progeny of Mad. Villard and Mrs T. ever be contested, the decision will be regulated by the laws particularized under the head of natural pregnancies.

CHAPTER XIV.

MONSTROUS OR ABNORMAL PRODUCTIONS.

The term monster is applied to a fœtus which deviates from the natural formation, whether such deviation be compatible with life or not; and whether it consist in deficiency, excess, or misplacement of parts. For philosophical investigation, this subject presents a rich and extensive field; but in a practical point of view, its range is limited. Productions of this nature are not confined to the animal creation alone, they are also found in the vegetable kingdom. They are more common among the young of our race than those of the lower animals, which, considering that they are multiparous, we should not at first expect. Females of our race are more subject to certain malformations than males; the left side of the body than the right; and certain systems of organs in preference to others.

Every human monster may be referred to one or other of the *three following classes; first*, those from redundance; *secondly*, from defect; and, *thirdly*, from confused formation.

In the first class may be included all productions which present either a multiplicity or a redundancy of parts, as supernumerary fingers, and toes; occlusion of the eyes, ears, nose, or mouth, closure of the anus, or urethra, also webbed fingers or toes, and enlargements from disease and overgrowth, as fœtus with hydrocephalus, and those which have acquired a greater development before birth than what is usual.

Under this head may be noticed fœtus which were large at birth, and afterwards acquired an extraordinary degree of development. The most remarkable within the last two or three centuries, has been a man belonging to the body guard of the Duke of Brunswick, who was seven feet several inches in height. The late Frederick of Prussia had a man in his body guard, eight feet two inches high. And in the service of the late Bishop Berkely of Cloyne, there was a boy named M'Grath, who at the age of sixteen was seven feet high.

In the second class, of which the varieties are less numerous

than those of the first, may be placed fœtus in which the upper part of the cranium only, or that and the brain are wanting; one or both arms; one or both eyes; one or both legs; a portion of the spine, as in *spina bifida;* a portion of the common integuments most frequently observed at the umbilicus, or where there is hare lip or cleft palate. Those wanting the brain are styled anencephalous, and though they live in utero, they generally die immediately after birth, since the lungs cannot be called into operation. The brain is oftener the subject of imperfect formation than any other *organ*, except those of circulation and generation. One of the most remarkable of this class is, where the whole head, or upper half of it is deficient. Cases are related where the nose was wanting. Jussieu, in 1718, exhibited to the Royal Academy of Sciences, a Portuguese female of 19, who wanted the tongue. Except where the brain is deficient, there are few well authenticated instances of the heart and lungs being absent. Haller mentions the case of a female who had but one kidney. The bladder has not unfrequently been found deficient, and then the ureters discharge their contents at the umbilicus. Sometimes the ureters terminate in the vagina or rectum. Such malformations are more common to males than females. Lieutaud and Richerand mention cases where the uterus was wanting. Dwarfs, or children who are of a very diminutive size at birth, and continue so, may be referred to this class. Many of these Liliputian race have been exhibited to the public, and a vast number of them described in books; but as great a wonder as any, was a well proportioned male dwarf presented to Louis XIV. in 1686. He was 36 years old, and so small, that he was shown on a silver salver, covered with a common sized towel to protect him against the inclemency of the season. His height was 16 inches.

In 1716, Mery exhibited to the Royal Academy of Sciences, a living infant sixteen hours after birth, in the sheath of whose umbilical cord, the liver, spleen, stomach, and greater part of the intestines were placed. The memoirs of the same distinguished society for 1712, contain a case in which the *heart* escaped through an opening in the upper part of the thorax, and was seen suspended from the neck, covered merely by the common integuments. Beclard mentions a case in which the whole heart with some of the thoracic and abdominal viscera protruded into the umbilical cord. In October 1821,* the author published a case in which nearly the whole of the stomach, all the small intestines, almost the whole of

* Edin. Med. Surg. Journ., vol. xxiv.

the colon, with the spleen, pancreas, and great omentum, were contained in the left thoracic cavity. The child lived six weeks, though from appearances, the left lung could not have performed any function. In May 1830,* he also communicated the particulars of another case, in which, besides several other defects, there was no diaphragm, and a consequent intermixture of the abdominal and thoracic viscera took place; but the greater proportion of the former were contained in an open, strong, membranous pouch, which was placed between the margins of the thorax and the crest of the ilium.

The third class, or monsters from confused formation, is very abundant in examples, as to it many instances of single and most double monsters may be referred; belonging to the first are those cases of the union of both extremities into one stump, mules, hermaphrodites, those where the abdominal viscera have been found in the thorax, or those of this last cavity in the abdomen; the right side of the heart where the left should have been; this last organ situated in the right instead of the left side of the chest; the large lobe of the liver in the left, and the stomach in the right hypochondriac region. There is a preparation of this kind in the Museum at Pavia, where all the organs of the body are placed at the reverse side from that where they usually are, for example, the heart and stomach are to the right side, and the liver and cœcum to the left. To this order also belong hybrid productions, of which the only example that is at all familiar to us among the larger animals, is the mule, they are likewise common among small birds bred in cages.

One of the most interesting of this class occurred on the 26th of October 1701, at Szony in Hungary.† They were two sisters joined, and were baptized Helen and Judith. The body of Helen was first excluded as far as the umbilicus; three hours after, the feet were expelled, together with the body of Judith, connected to that of Helen. Although they were united at the back below the loins, yet they were turned with their faces and bodies half sideways towards each other. One anus, situated between the right femur of Helen, and the left of Judith, was common to both. *Unam quoque habebant vulvam intra 4 pedes reconditam, ut dum erectis starent corporibus, ne vestigium ejus conspicuum esset.* The desires to attend to the calls of nature affected them separately. In her sixth year, Judith was seized with palsy of the right side, and continued to suffer from its effects for the remainder of life; but Helen on the contrary, became more active, lively,

* Ibid. vol. xxiv. † Phil. Trans. Lond. abrid. Edit. vol. xi. p. 142.

and beautiful. A difference was also observable in their vital, animal, and natural functions, in health as well as in disease. And although they had the small pox and measles at the same time, yet they had other disorders separately. Judith was often convulsed, while Helen remained free from indisposition. Helen had a pleuritic affection. Judith had a fever. One of them had a catarrh and a cholic, while the other continued well. At the age of sixteen the catamenia appeared and continued, but not at the same time, or in the same manner, or in equal quantity. Sometimes the one, sometimes the other, would be more disordered on such occasions; but Judith was more frequently convulsed, and was subject to various hysterical and pectoral affections. In their intellectual powers, there was a striking difference; Helen was very engaging in her manners; they both beside their vernacular tongue, could speak German, French, and English; they could read, write, and sing very prettily. While the one was asleep, the other was often awake.

On the 8th of February, 1723, in the 22d year of their age, Judith was seized with violent convulsions, succeeded by coma, which terminated fatally on the 23d of February. During this time, Helen was affected with fever, accompanied by frequent faintings, whereby she was so much debilitated, that although she was still sensible, and could speak, she fell into extreme suffering, three minutes before Judith; and after a short struggle, they both expired almost at the same instant.

On dissection, each was found to be provided with distinct viscera, though they had but one anus in common; and their sacra, aortæ, and venæ cava, were connected. The viscera of Helen were all healthy; but the heart of Judith was much enlarged and inclosed in a very strong pericardium; the right lobe of the lungs was in a putrid state. The spines of each were distinct to the second portion of the sacrum, where they became united. The aorta from each formed a common trunk upon the sacrum, and afterwards divided into common iliacs. In like manner the common iliac veins formed upon the sacrum a common trunk, which afterwards divided into a vena cava for each body. A case is related, where a separation was successfully accomplished in two female fœtus united by the ensiform cartilages, the union extending to the umbilicus.* In the Journal de Verdun for 1709, there is a case resembling the Hungarian sisters; the age to which the ladies lived is not mentioned, but it is stat-

* Dict. des Scien. Méd. vol. xxxiv. p. 162.

ed, that they had acquired a knowledge of several languages. In the Phil. Transac. Lond. is related a case with one body, two heads, four hands and arms, three legs, one navel, one anus, and two sets of female genital organs. While one head was awake, the other slept; or the one was quiet while the other would cry. They both died at the same instant.* Dr Berry relates the particulars of two female children united by their sterna. Medicine given to either affected both; one would wake while the other slept, but both generally slept at the same time; and what was more remarkable, one was entirely nourished, for some months after birth, by what was received into the stomach of the other.†

The whole civilized world must have heard of Chang and Eng the united Siamese brothers, who were brought from Siam, and exhibited in this country in 1829-30. They were born in May 1811, and their mother during her pregnancy with them suffered less than with any of her former children; and her delivery also was easier.

At the period of their visiting Europe their resemblance to each other was not remarkable. With the exception of the spine of Chang, which had a lateral curvature, all their parts were well formed. Chang's left eye was weaker than the right; but this was reversed in the case of Eng; so that each would see best with the eye nearest his brother.

The band of union was formed in the following manner. At the lowest part of the sternum of each boy, the ensiform cartilage is bent upwards and forwards, meeting the other in the middle of the upper part of the band, where moveable joints exist, which admit of vertical as well as lateral motion, each junction appearing to be connected by ligamentous structures. The outline of the band is convex above, and arched below. When the boys face each other, the length of the band at the upper end is one inch and three quarters; at the lower, not quite three inches. From above downwards, it is three inches and a quarter; and its greatest thickness is one inch and five eighths. In the centre of the lower part of the band is the cicatrix of a single navel, showing where the cord or cords had entered. No pulsation can be distinguished in the band.

Asparagus given in the food of either separately, did not communicate any odour to the urine of the brother who did not partake of it; which shows that the vascular communication betwixt them is not extensive. On the 9th December 1829, both had bronchitis, and the pulse of each beat 90.

* Vol. xiv. p. 180. abrid. Edit. † Edin. Med. Surg. Jour. No. xc. p. 150.

They both had measles; and at eight years of age, the confluent small pox. They take their meals together, but neither will eat or drink what the other dislikes, though they occasionally take different kinds of food. When the appetite of the one is satiated, that of the other is so also. They always fall asleep at the same moment, and it is impossible to wake one without also arousing the other. When asleep, if the one be touched, the other invariably answers.

In speaking of double fœtus, it is proper to mention, that the one is sometimes so secluded in the body of the other, that the existence of a second is ascertained only after death; at other times, the head, nates, or some other portion of the partially secluded fœtus, projects from the body of the better formed one. Winslow was the first who offered an account of these productions. According to Hall and Meckel, monsters of this kind are more frequent among males than females. Among the supernumerary organs which have been observed, two rows of teeth have been seen in one jaw in adults. Dillenius alludes to an individual who had two tongues. Haller, Venette, and Scharff, mention cases of supernumerary kidneys and testes. Haller quotes from Brochetani, a case where there was a double penis; and Ferraria has seen this organ with two orifices. In females also, supernumerary genitals have been seen: Voltaire, in his Philosophical Dictionary, mentions a Roman female who had four breasts, the one placed immediately below the other; Percy speaks of one who had five. Haunceus relates an instance of five nipples to one mamma, from all of which milk flowed when one only was drawn. Several examples have been recorded, where females possessed a double uterus, and to each a vagina.

Supernumerary organs of sense have been witnessed. Moriceau speaks of a cow, which was killed in a slaughter-house in Paris in 1775, and she had five eyes, three of them in the back of the head.

All the opinions which have been advanced regarding the formation of monsters, may be reduced to the three following heads; *first*, that they arise from the influence of the imagination of the parent on the fœtus during its retention in utero; *secondly*, that they are produced by some accidental cause; and *thirdly*, that they are original. *The first opinion*, although long and generally adopted among the best informed as well as the ignorant, is nevertheless untenable. Although we do not now admit the influence of the imagination of the mother to the extent which was formerly done, yet I would not reject it altogether, since it is possible, that

during conception, and indeed for some time afterwards, the state of a woman's mind—not mere fancy or imagination, but violent mental excitement, may exercise an influence on the germ, and be the cause of some of those irregularities which at some future period present themselves in the fœtus. Though it is uncertain in what relation the germ stands to either parent, unquestionably its evolution is a function of the maternal system, and from the moment this commences there can be no reason why that state of the mind, which is capable of modifying the action of some of the most important organs, should not also exert an influence on those of the genital system during the fecundation of the germ. Or, in other words, if an impression of a moral nature can modify digestion, secretion, and every function whatever, its influence may certainly be admitted in the process of conception. And how often, indeed, does mental excitement lead to the destruction of this important function altogether. But though their influence in causing disturbance in the uterine system cannot be questioned, yet it would seem that their power in deranging the regular structure of the fœtus is not so great as might *prima facie* be supposed; since unmarried females, who must suffer most from causes of this nature, do not produce malformed fœtus so often, comparatively speaking, as the married. Of the numerous examples of monsters which have come under my notice, all but one were the product of legitimate impregnations. Moreover, monsters are often generated by the lower animals, in which the power of the imagination cannot be great.

In the unimpregnated, but more especially in the gravid state, frequent mental agitation often gives rise to formidable symptoms; and in very numerous instances, under such circumstances, a progeny is generated who are subject to rachitis or scrofula in after life.

The second hypothesis, which is most plausible, and very generally adopted, is, that some varieties of monsters are produced by accidental circumstances, occurring some time during pregnancy, from the earlier stages of this function until within a short period of its completion. Many facts may be advanced in favour of this theory, which is the most ancient of the whole. In the first place, we must admit that those deformities which show themselves after birth, and of which we are frequently eye-witnesses, have disease for their origin; of these, rachitis and mollities ossium are familiar examples. And secondly, as the fœtus is sometimes born in a diseased condition, is it not presumable that some congenite malformations have the same origin as those which

are developed after birth. They may in fact result from physical or moral causes, and depend on the parent or fœtus itself.

Notwithstanding the care which nature has displayed in affording protection to the embryo, injury to its delicate structure, while it is in a gelatinous state, or even when more perfectly organized, from rapid movements on the part of the parent, either owing to the percussion which may result from external agents, or from the various actions of her own body, is quite within the range of possibility; it may suffer injury from the pressure of the parts by which it is surrounded; so that the physical causes by which it may be acted on, are numerous.

Derangements of that unknown power on which organization depends, are causes still more numerous than the physical. Allusion has already been made to the double influence which the parent exercises over the embryo in the early stages of its formation, and after organization has made further advances. On the one hand, it has been observed, that the moral condition of the parent may modify the degree of perfection with which the process of conception is accomplished, and, consequently, may in some degree influence the regular or irregular development of the fœtus; on the other hand, it has also been formerly remarked, that as the embryo derives from the fluids of the parent that principle which is necessary for its development, its evolution is dependent on her. When, therefore, the mother does not furnish healthy materials for the growth of the fœtus, or when she is labouring under disease, an unhealthy offspring may be produced. The development of the fœtus may be affected, not only by the hereditary diseases of the parent, but also by those which may be generated in its own system. Utero-gestation is the period in which the growth of our race is most rapid; and from what occurs during infancy and childhood, it may be presumed that the liability to disease is in the same ratio with the rapidity of growth. Moreover, not only is the increase of the fœtus most rapid during its uterine life, but this also, as formerly stated, is the period at which the different organs are most delicate, and consequently most susceptible of modification or change. Whether we admit the evolution in its full sense, *i.e.*, allow that every part of the fœtus exists *ab origine* in miniature in the germ, and is afterwards only developed; or we suppose that every part of the embryo is progressively evolved after sexual intercourse, we may safely admit in either case, that slight causes even, may produce some change

in the regular order of the development of the parts. M. G. St Hilaire, in his investigation on this subject, relates many instances in which malformations could be clearly traced to a variety of injuries, as blows on the abdomen, corsets too firmly laced round the body, and severe mental agitation, produced by unpleasant sights or other causes.

Under the head of *accidental causes* must be noticed, the very happy views of the distinguished German anatomist, Meckel, and the ingenious French naturalist St Hilaire; who, without any knowledge of each others investigations, have arrived at the same conclusions regarding the formation of some monsters. They maintain, that the various organs of the human body, from their primeval origin to maturity, pass through different stages of formation, each of which, progressively, resembles the fixed and regular form of inferior animals, that each organic development proceeds primarily from the circumference to the centre; and that by certain causes, either of these principles may experience a check, and be indeed reversed; and hence a certain order of malformations. For example, the growth of an arm or leg, finger or toe, may be suspended; or cohesion of the palate, upper or under lip, or of the abdominal parietes, at their central union, may be arrested. According to these philosophers, then, certain facts of monstrosity arrange themselves under two different heads,—some recognising as their cause, an *arrestment* of development in certain points; others, a *retrogradation* in the effects already produced. Thus, in the former case, the malformation is said to depend on a weakening of the vital action; and, in the latter, on an excess of the vital energy, creating morbid conditions, and generally terminating in a transformation of the parts affected.*

Finally, what contributes to render the opinion, that some monsters are produced by accidental causes, most probable, is, that independently of the arguments which have already been advanced, it is the explanation most applicable to the greater number of known monstrosities. In fact, almost every variety of monstrosity may be referred to some morbid change; almost every one of them retains traces of that affection from which it has derived its origin, as will be understood when we come to apply the various systems of which mention is made, to every kind of monster that has been particularised. To accidental causes, may also be referred the hypothesis, that "the germ may be cleft for a certain distance, either at the part where the head, or at that where

* Meckel Anat. Gener. Trad. par Jourdan et Breschet, vol. i. p. 77. Dict. d'Histoire Nat. Art. *Monstre*, vol. xi.

the tail is at a later period formed; or without any cleft being formed, the parts to be developed doubly, in the direction of the axis, the consequence must be, that two heads, or two caudal extremities will be formed. All the cases of twin monsters, are not explicable by this division of one germ, nor all by the growing together of two germs. The concretion of the germs, or the production in one germinal membrane of two embryos which have afterwards grown together, affords the best explanation of a great part of the double monsters, particularly while the double portions are large." There can be no doubt that embryos do grow together, as for example the Siamese twins, and where fœtus are united by but a small portion of the body, as by the occiput only.

By the third theory, the formation of monsters is explained upon the principle that the germ is anormal from the first. Those who are of this opinion, do not, like the supporters of the preceding hypothesis, affirm, that this will account for the formation of every monster. They admit that most of them may be referred to the second theory, but that there are other examples which can be explained by the third hypothesis only. The sole fact which favours this idea is, that certain malformations, as supernumerary fingers, and toes, or hare-lip, have been observed to be hereditary. This, though a convenient mode of reasoning, cannot be admitted; for to suppose that the germ, of which every thing but the term itself is a mystery to us, or the materials provided for its formation, were originally intended to be so disposed or arranged, as to constitute a being which, after its emancipation from the uterus, should be found so defective, that it either could not support life, or execute those faculties or functions which are the high attributes of our race, would be to impugn the power and goodness of the Creator. Both observation and analogical experiment, would also seem almost entirely to disprove the notion of inherent malformation of the germ. *First*, Parents of defective formation do not generally engender a defective progeny. *Secondly*, The superinduction of uterine disturbance and monstrosity, are in many instances, consecutive to a period in which mental and corporeal violence have been allowed to act during gestation, as related by St Hilaire; and, *thirdly*, The production almost at pleasure, by the same ingenious philosopher, from eggs placed in an oven, and preserved in a higher state of temperature than would have resulted from natural incubation, of monstrosities of various kinds in chickens, shows, that extraneous causes, and not inherent or

original malformation, will account for their production more rationally.

In the application of the foregoing principles, it may again be remarked, that for many of the varieties belonging to the first, or class of redundant monsters, the second theory seems by far the most plausible that can be offered. In some, as for example, those which result from the union, more or less intimate, of two fœtus, and where, apparently, there is but one head and two bodies; two heads and one trunk; three arms or three legs, with only one head and one body, the remainder of the double organs, though small from pressure and absorption, has occasionally been discovered by careful dissection. In the examination of a fœtus who had two heads and only one trunk, Lemery discovered two spines and their respective ribs, which, from the pressure they had experienced, were partially obliterated. A similar case is related in 1702, by Geoffron.

As already mentioned we know that occasionally two ovula are fecundated at once, and that in their transit to the uterus, they become attached, either superficially or more intimately, according to the degree of pressure to which they have been exposed. Similar phenomena may often be observed in the vegetable kingdom, two peaches, apples, cherries, or hazel nuts, have been seen adhering from original close contact. From many preparations in my possession, there is reason to believe, that in the animal kingdom, this union takes place in early pregnancy.

The phenomena known under the term graft of plants, do not elucidate the junction of parts which characterise some monstrosities. To effect the *graft*, it is only necessary that the bark of one of the plants he denuded, and placed in contact with the bark of the other. The homogeneousness of the parts in contact, inclines to unite and amalgamate. In the case, however, of animal monstrosities, the circumstances required for such unions, are more numerous and complicated; and the chances, accordingly, are less in their favour. The tissue of the bark is homogeneous throughout its whole extent, and composed of the same materials, and when applied to the bark of another plant, meets always with a similar combination, and hence their aptitude to unite. But the integuments of the fœtus are not composed of similar parts. According to each region, there is a different system of vessels and nerves. If two sets of vessels be brought into contact, whose filaments meet transversely, what power or circumstance will lead them to unite? They are superincumbent with regard to each other, but they will re-

fuse to interlace or agglutinate. The action by which agglutination is effected, can only be exerted at the points of the vascular and nervous extremities. When two structures of a similar nature are brought together; when the terminal mouths of a number of vascular and nervous filaments meet terminal mouths of a similar description, there will be the same attraction as between the homogeneous parts of the bark, the same disposition to adhere and anastomose. Now, in order that there may be an exact coincidence between two collections of nervous and vascular points, it is necessary that each set or collection proceed from different subjects, such as occurs in the case of twins. When the partition which separates them is pathologically destroyed, and the twins meet back to back, belly to belly, or head to head, we have all those singular junctions related in treatises on monstrosity. None of these double monsters are ever the product of false correspondences, in the sense which is attached to this expression. We never meet with two subjects joined by different parts; for example, a union of the abdomen of one fœtus to the extremities of another, of the belly to the back, or of the head with a part of the trunk.*

The varieties of the first class must be differently accounted for; as fœtus which have been described with two hearts, a double uterus, and two urinary bladders. But, as in former times, a greater number of these *lusi naturæ* were spoken of, than have been since anatomical investigations have been conducted with a greater love of truth; and as, in such cases, we are not informed that the two hearts were furnished with a double set of venæ cavæ, and aortæ; or the double uterus, with a corresponding number of tubes and ovaries; the varieties in question, admitting their occurrence, may be easily explained, if we allow, that the development of parts proceeds from their circumference to their centre, and has *there* been arrested, and agglutination prevented.

Another variety of this class, supernumerary fingers and toes, may be considered original, and in some families hereditary; and perhaps it is as possible for the fœtus to inherit this curious formation as traits of external formation or resemblance, moral dispositions, and the diseases of parents, as may be daily observed in the young of our race.

In regard to giants, some cause or other, generally after birth, forces their development. It cannot be attributed to any inherent principle in the germ, since giants do not propagate a progeny of correspondent magnitude. Extraordi-

* Dict. Class. d'Hist. Nat. tom. xi.

nary stature has, in some instances, been thought to result from the influence of regimen, and it was in this manner that Bishop Berkely of Cloyne was said to have succeeded in making young M'Grath a giant. The bishop found him a forlorn orphan in the streets of London, took him into his establishment, and subjected him to the experiment of rich feeding. To show that this increased development cannot be ascribed to any condition of the germ, but to some principle imbibed after birth, it has been observed, that such increase of size never occurs except at the expence of the durability of life; for, it has been remarked, that they do not live long, nor are they so active as persons of ordinary stature.

Defective monsters, or those belonging to the second class, are easily accounted for. When a fœtus is born deficient in a leg, arm, or any other organ, we may, without any difficulty, understand, that the part may have been arrested in its evolution, or destroyed even, by pressure or disease, and though denied by such eminent men as Soemmering and Prochaska, yet its rudiments are generally discovered on dissection. Productions in which the brain is wanting may be ascribed to some injury done to the medulla spinalis. Congenite hydrocephalus may, in some instances, without difficulty be traced to frequent mental agitation, intemperance, and injuries received by the parent during gestation. Both these varieties are of frequent occurrence, particularly the ancephalous monster. Whenever disease occurs in the centre of the brain, frequently the development of organs which receive particular nerves, is suspended. Deficiency and retarded evolutions of parts are not to be ascribed to pathological conditions of the brain solely; for obliteration of the artery of the part may have the same effect.

The fœtus in utero is subject to inflammation and its consequences. M. Chaussier and others* mention cases in which the limbs sloughed off during the retention of the fœtus in utero, and were afterwards expelled with the secundines. The author has seen, in the same family, three male fœtus, born at separate births, with a large ulcer on the scalp of each, in the tract of the sagittal suture.† Inflammation of the brain, or its membranes, with consequent effusion and pressure, may, in some instances, explain the phenomena of congenite hydrocephalus. In speaking of defective monsters, I may here cursorily mention the supposed causes of dwarfs.

* Edin. Jour. Med. Science. No. III.

† A very interesting case, bearing immediately on this variety of malformation, is related in the Dublin Journ. Med. Chem. Sci. No. 2, p. 140.

Some of these have been exceedingly diminutive at birth. In the Dict. des Scien. Med. the particulars of a case is related, in which the little gentleman measured only six inches, and weighed a pound and one-half, when born. Some dwarfs owe their diminutive size to rachitis; others, it is said, to radical weakness of the constitution. Whatever may be the cause of this radical weakness, and at whatever period it may commence to exert its influence, the suppressed evolution of the body may be ascribed to it. As dwarfs do not generate a race like themselves, this cannot be viewed as an inherent, but an acquired state of the ovum. It would appear, that this weakness is irreparable, since it exhibits itself in all the phases of life; for it not only contracts the development of the organs, but limits the duration of life itself. Dwarfs rarely attain old age; if, in youth, some among them exhibit a degree of activity, this is soon succeeded by inactivity; and frequently, at no great length of time after puberty, old age advances.

The varieties belonging to the third order are numerous, and may, for the most part, be ascribed to original conformation; by which I wish to be understood, derangement in in the original disposition or organization of parts. For, as very properly remarked by Meckel, the attempts to explain their formation on mechanical principles, are so absurd, as to refute sufficiently the hypothesis they are intended to support. It is impossible to account, upon any other principle, for transpositions of the viscera. To this order also belong hybrid productions, of which the only example that is at all familiar to us among the larger animals, is the mule. The general appearance of animals of this character, explains their own origin.

CHAPTER XV.

INFLUENCE OF THE IMAGINATION OF THE PARENT ON THE FŒTUS IN UTERO.

Though the influence of the parent over the fœtus in utero, and to the extent admitted in the preceding chapter, cannot be denied, yet it would ill accord with the present state of our knowledge, to believe in her power of communicating colours, supernumerary parts, and many other appearances, which the vulgar have in all ages ascribed to her.

The first record of this doctrine is to be found in sacred history.*

The ignorant did not perceive, in the miracle referred to, the influence of divine power, but viewed it as the effect of the agent employed, on the instinct of the brute tribe. Hence, when any thing unusual appears in the young of our own race, it has been customary, from this analogy, to ascribe it to some cause which might have made a powerful impression on the mind of the parent. From the patriarchal times until the early part of the eighteenth century, nobody thought of opposing these extraordinary notions, but, on the contrary, to support them; and among the distinguished persons who have done so at different times, we even find the names of Stahl and Hoffman.

Father Malebranche, who was one of the most strenuous advocates of this docrine, ineulcated that there was a communication between the brain of a pregnant woman, and that of the infant in her womb; that both were intimately connected; that they possessed the same sensations, the same passions; in a word, all the same thoughts which arose in the soul after corresponding motions in the body; and that the latter saw, heard, and received the same impressions of objects which their mothers did, and were agitated by similar passions. In support of these opinions, he states, that there had been an inmate of the hospital of incurables, a young man, an idiot from birth, in whom there were fractures of such parts as were broken in persons who were subjected to the torture of the wheel, and that for twenty years he survived his miserable condition, which had been caused by his mother, when pregnant, having witnessed this species of punishment. Every blow inflicted on the felon forcibly affected the imagination of the mother, and, by a sort of counter stroke, the delicate brain of the infant. The same organ of the parent, though much disturbed, and perhaps lacerated in certain parts, was, however, sufficiently firm to withstand entire dissolution. The brain of the fœtus, on the contrary, unable to resist the commotion of the spirits, was entirely separated, and the ravages were so great, as to deprive him of reason for ever after.

That a proper estimate may be formed of the support which Father Malebranche has furnished to this extraordinary doctrine, another instance of his extravagance may be added. He says, "not quite a year ago, a woman who had gazed too attentively on the painting of St Pius, during the

* Genesis, chap. xxx. verses 37, 38, 39.

celebration of the festival of his canonization, was delivered of an infant which perfectly resembled him. He had the countenance of an old man, as far as an infant without beard is capable. The arms were crossed on the breast, the eyes raised to the regions above, and the forehead was very small;—as in the painted representation of this saint, which is raised towards the ceiling of the church, in looking at the clouds, there is almost no forehead. He had the figure of a mitre reversed on his shoulders, with several round marks on the places where the mitres are covered with jewels.* Père Malebranche makes no mention that any other female was similarly affected on either of those occasions, which is rather unfortunate for his doctrine.

Similar prejudices were also supported by Hippocrates and Galen. In one of the works attributed to the former, it is admitted, that the fœtus may exhibit marks or deformities in consequence of the capricious desires of the mother during pregnancy. The father of medicine, on one occasion, rescued from punishment a female of rank, who, though fair herself, nevertheless produced an Æthiopian infant, which Hippocrates ascribed to her having been in the habit of gazing at a painting of that colour. These extravagant notions, from what has been stated by Galen, were not limited to physicians of his times, but were entertained by the community in general; for he informs us, that the ancient Greeks and Romans, in order to have beautiful children, took special care that matrons should behold agreeable paintings only, beautiful statues, and other objects fitted to excite the most pleasing and delightful mental images. Galen further states his having learned from an ancient record, that a certain person, deformed, but wealthy, desirous to beget a well-formed infant, caused to be delineated on a board, the figure of a comely child, on which he commanded his wife, *inter coeundum*, to gaze; and so stedfastly did she fix, not only her eyes, but her very soul, on the lineaments of this figure, that she produced an infant which resembled not the father, but the painting *entirely*.

De Superville, a physician of the early part of the eighteenth century, among many other marvellous congenital marks and deformities which he had witnessed, relates, that in a sow just slaughtered, her seven young ones had all the bloody marks of the knife about their necks. He also mentions the case of a cloth-shearer in Holland, who, having been attacked by some drunken young fellows, was stabbed

* Malebranche, de la Recherche de la Verité, tom. i. livre ii. chap. iii.

in upwards of twenty places. He was to have been married that very week. His sweetheart saw his corpse naked with all those wounds, and was two days after delivered of a dead child, which exhibited wounds in parts exactly corresponding to those of her dead lover.*

It would not only be a waste of time, but an insult to the understanding of persons of the most moderate capacity, to enter at the present day into any very lengthened refutation of the foregoing stories, which are in themselves so extravagant, and so void of probability, as to destroy the fabric they were intended to support. Except by Rochæus, and Mercurialis, of the 16th century, who merely doubted the capability of the imagination of the parent effecting such remarkable changes, these extraordinary ideas were allowed to pass current until 1716, when M. Marcot, of the Royal Society of Montpelier, made the first serious opposition to them. While he distinctly asserted that he did not believe the imagination of the mother capable of effecting changes so considerable, he at the same time denied that the connection between the mother and child was so intimate as Malebranche had fancied. He admitted the communication of diseases, of morbid disposition, and the hereditary disposition of temperament, appetite, and inclinations; but these, he very properly remarked, would prove nothing regarding the power of the imagination, and were totally independent of it. He ascribed every deviation in the form of the fœtus, whether by additions, deficiency, or confusion of parts, to obstruction, compression, or twisting of the funis, and whatever might interrupt or modify the passage of blood to it.† In 1727, Dr James Blondel, another powerful opponent to this doctrine, appeared; and from his time its advocates have been fast diminishing.

To set this matter in a proper light, it will be necessary before we conclude, to analyze the subject. *First*, then, are the cases which have been related, to be relied on? This question I must answer in the negative; since in former times, the marvellous, in too many instances, took precedence of truth; since innumerable cases are recorded where pregnant females have been violently frightened without the supervention of any unpleasant consequences; and since infants have presented deformities at birth, where neither the fancy of the parent, nor any of the causes vulgarly assigned, ever operated, or could be traced. History affords a most satis-

* Phil. Tran. abrid. edit. vol. viii. p. 385.

† Mémoires de l'Acad. Royale des Scien. Annéc, 1716, p. 415, sur un enfant monstreux.

factory instance in refutation of this doctrine, in the murder of Rizzio in the presence of Mary Queen of Scots, when pregnant with James VI.; but he was born without blemish. Blondel relates the case of a lady who had all her life a violent antipathy to cats. One evening, a huge one of these animals sprung upon her, and required to be beaten before she could be drove off; but the lady went to the full time, and produced a perfect child. A lady of my acquaintance had occasion, a few years past, when great with child, to go during the summer season to a distant part of the country. She had scarcely taken her seat in the stage-coach, when a negro entered and sat opposite her. The coach had not proceeded far, when the lady became much indisposed; and her sable neighbour suspecting the powerful odour from his person to be the cause, as the day was very warm, he volunteered to travel outside. From this time the lady was so impressed with the idea that she was to produce a coloured child, that at the moment of her delivery, she called out whether it was black? *Secondly*, Observations teach us, that extensive corporeal injuries are sustained by pregnant women, as in surgical operations, or accidents from ferocious animals, but they have nevertheless been delivered in due time of healthy and perfect infants. In the summer of 1827, I delivered a lady of fashion, who, while in the fourth month of pregnancy, had been operated on by a surgeon of this city, for fistula *in ano*. She asked me seriously while in labour, whether it was likely the child would have any scar on its body, as she was assured by her friends it would, and that she firmly believed it. I need not add that the infant was perfect. *Thirdly*, We may say that such a thing is contrary to the laws of the animal economy, since no mental effort of the parent, were she of low stature, or blind of an eye, could increase her height, or confer vision. *Fourthly*, If the fancy of the parent possessed the alleged influence, it might be destructive of one of the most important ties in society; for the sex might submit to the intercourse of blacks, and could easily conceal from their unsuspecting relatives the adulterous commerce, by the easy expedient of continually fixing their attention on their husbands, or objects of a bright colour. *Fifthly*, If imagination had the power of producing colours, why should not infants be marked with grapes and green goose-berries, as well as with cherries or red currants, since it may be presumed the mother will as often have longings for the one as for the other; or why should we meet with deformities among the lower animals, and in plants even, where the fancy, more especially in the

latter, cannot be concerned? *Lastly*, It is very unlikely that any such influence exists, "from the mere circumstance that it must pass from one organism to another," and between these organisms there is no direct connection—they are distinct and separate, though placed in the closest possible juxta-position, exerting an influence on each other by their contiguous surfaces, and one deriving from the other its nourishment; and all unusual appearances can be more scientifically explained, by referring them to original malformation, the effects of mechanical pressure *in utero*, or to injury done to the organization of the fœtus, while in a gelatinous state, by succussions on the part of the parent.

CHAPTER XVI.

MEDICO-LEGAL SUBJECTS CONNECTED WITH PREGNANCY AND DELIVERY.

There are few positions in which a medical man can find himself more painfully, or disagreeably situated, than when called upon to investigate and decide any of the medico-legal questions relating to pregnancy. A hundred years ago Van Swieten wrote, "Nunquam forte magis periclitatur fama medici quam ubi agitur de graviditate determinanda;" and with all the light that science has since reflected upon these questions, our decisions are but little increased in accuracy. It is not many years since the mental misery inflicted on a highly respectable female, in the upper circles of society, by the groundless suspicions cast upon her honour, was the cause of her death, and this too by one who ought to have been better informed. Nor is it long since a female prisoner suffered the last penalty of the law, though, on post-mortem examination of her body, a fœtus of at least four months was found in her uterus; and a woman was opened alive, for Cæsarian section, in Berlin, under the direction of Dr Busch, Professor of Midwifery in that University, and neither a fœtus, a pregnant uterus, nor a tumour of any sort, was found in her abdomen.* With such mistakes as these before his eyes, a medical man may well feel some hesitation in approaching the investigation of these questions.

* Lond. Med. Gaz. 1828, p. 380.

Sect. I.—*Concealed Pregnancy.*

The grand object for which pregnancy is concealed by the sex, is to maintain before the world an unsullied reputation. It is in unmarried females especially that pregnancy is concealed; but it may be done by married women when they are separated from their husbands, or when he may have been casually absent for a considerable period; it has also been known to have been concealed from the medical man, under the hope that if the female complained of amenorrhœa only, he would order some drugs to act upon the uterus, and thus unintentionally produce abortion; and again, it may be concealed to favour the procuring of abortion, at a convenient moment, or the commission of infanticide at the birth of the child. In Scotland a woman may be tried for concealment of pregnancy alone, and punished with imprisonment; but in England she cannot be tried for concealment of pregnancy, without being first tried for infanticide. In the investigation of concealment of pregnancy, it is necessary to be familiar with the Signs of pregnancy, which will be detailed in a subsequent chapter.

Sect. II.—*Feigned Pregnancy.*

In a legal as well as in a medical point of view, there are several circumstances under which it becomes a matter of the highest importance to determine the reality of this state. Gestation may be affected for a variety of reasons; 1*st*, To allay domestic grievances, where a husband is continually reproaching his wife for her sterility; 2*dly*, To deprive the lawful heir of his inheritance; 3*dly*, To extort money; and, 4*thly*, To delay the execution of punishment. Cases of this nature have at different periods excited much public attention. Of this description was Bianca Capella, the mistress of the Grand Duke of Tuscany, who, in order to gratify his wish of having an heir, feigned herself pregnant, and at the expected period introduced the child of another person as her own. An instance of the second is where a widow is suspected of feigning pregnancy in order to produce a suppositious heir to the estate of her deceased husband. In a case of this nature the heir-presumptive may procure a writ *de ventre inspiciendo*, to ascertain whether she be pregnant or not; and if in this condition, to keep her under strict surveillance till after delivery.* But if it be decided that she

* Some idea of the interest which these cases have occasionally created in this country, may be learned from the following particulars. Sir Francis

is not pregnant, the presumptive heir is admitted to the inheritance, though liable to lose it again, on the birth of a child within forty weeks of the death of a husband.

The case of Joanna Southcott was probably with a view to extort alms, or under the influence of a religious fanaticism. She at the age of sixty-five declared herself pregnant, while she at the same time asserted that she was a virgin, and was to produce the Messiah of the Jews. This gross imposture had its believers among the members even of our own profession, while many of her own sex vied with each other for the happiness of furnishing swaddlings and a cradle for the progeny of Joanna. The decease of this woman, however, prior to the expected period of delivery, led to the detection of her hallucination, as it was proved on dissection that she was not pregnant; and exposed her credulous disciples to the contempt of mankind.

The third case is that in which a female is capitally convicted, and pleads gestation in delay of execution. But strange to relate, in England this retards the punishment in those examples only where it can be proved that the gestation has advanced as far as the period of quickening—while in females who have not quickened, the law is permitted to take its course; in Scotland, however, if a felon is proved to be pregnant, at any period, no matter how early, the pronouncing of the sentence and punishment is stayed until after delivery. The court may even interfere on proof of pregnancy being afforded, where a woman is incarcerated, and danger of life, in consequence, is apprehended; in which case, it may be necessary to admit her to bail.

In former times, when it became necessary to determine the presence of pregnancy, this duty was intrusted to a jury of matrons; and, indeed, I am not sure that this part of the law has yet been rescinded, though from the gross errors they have frequently committed, and from which some members even of our own profession have not altogether been

Willoughby died, seized of a large inheritance. He left no sons, but five daughters, one of whom was married to Percival Willoughby. At the time of his decease, his widow stated that she was with child by him. This circumstance was naturally considered of great importance to the daughters, since, if the issue were to prove a male, they would be deprived of their inheritance. Percival Willoughby solicited for a writ *de ventre inspiciendo* in reference to the widow, and the sheriff of London was accordingly directed to have this duty executed by twelve midwives, who reported that she was twenty weeks pregnant. Whereupon the same officer was ordered to keep her safely in such an house, of which the door should be well guarded; that he should daily cause her to be seen by some of the women who had examined her; and that to prevent any imposition, some of them should be in attendance during her delivery. Beck, page 72.

free, this investigation has for a long time past been committed to male practitioners.

The true condition of females in the foregoing cases must be elicited by a thorough acquaintance with the Signs of pregnancy, which will be detailed in a subsequent chapter.

Sect. III.—*Concealed Delivery.*

The motives for concealment of delivery, are similar to those which may have induced a female to make a secret of her pregnancy. As a prelude to investigations connected with the crime of infanticide, the medical jurist is often called upon to determine whether an individual has been recently delivered; which, when an inquiry is instituted within a week after parturition at the full term, may be easily ascertained. The signs of recent child-birth are, prostration of the locomotive powers, a delicacy and pallid appearance of countenance, a subsidence of the eye into the orbit, an obvious acceleration of the pulse, and an excited state of, with moisture on, the skin,—the exhalation having a peculiar acid odour. These, however, are uncertain phenomena, and our inferences are to be chiefly deduced from the condition of the genital organs, and of the abdomen. If an examination be made sufficiently early, the parietes of this cavity will be found so much relaxed, that a fold of them may be taken in the hand; they are corrugated, and on minute inspection, found traversed by whitish lines. These may be traced for several days or weeks even after delivery; but the other conditions of the integuments are transient. In regard to the female organs, the mammæ will be found painful, tumid, distended with a lactiform fluid called colostrum, which continues for two or three days, and then becomes fully formed milk: this fluid differs from milk, in being of greater specific gravity, yellowish, and more viscid; they differ also widely in their microscopic characters, the milk being composed of globules resembling those of oil, but the colostrum chiefly of granular corpuscles; the nipples are surrounded by a dark coloured areola. The external genitals are tumified, red, relaxed, and imbued with the lochia, and the vagina smooth and wide. By the application of the hand to the abdomen, the uterus may be felt of considerable volume; and by an examination per vaginam, we can distinguish an unusual enlargement and dilatation of the os and cervix uteri. There may be also laceration of the perinæum; this is not a frequent

sign of delivery n this country, though a very common result of German practice.

Some of the foregoing signs are certain, but against others objections may be urged. As to relaxation and the albugineous lines of the abdominal parietes, no cause that I am aware of can lead to these conditions, except pregnancy and ascites; and if the latter has given rise to it, the diminutive size of the uterus and the cicatrix of paracentesis abdominis, will decide the nature of the case. A collection of hydatids in utero may occasion partial distension of the parietes of the abdomen, but rarely if ever to the extent of producing the conditions in question. The presence of milk is certainly one of those signs which cannot be relied on, though it has been stated by a veteran accoucheur, that it is impossible for this secretion to take place independently of pregnancy. In opposition to this declaration, however, milk has been secreted, not only by the breasts of females who had never conceived, but by the same organs in males even.* The areola around the nipples is not so infallible a sign, as it was formerly alleged, as a tolerably well formed circle may be caused by uterine derangement, amenorrhœa, dysmenorrhœa, and even by cessation of the menses, so that it does not form a symptom of pregnancy exclusively, although, except during this state, *all* its characteristics are seldom found fully developed. As to turgescence, tumefaction, and relaxation of the external parts, these are indubitable signs of over distension and pressure; and such conditions must be present to some extent for several days after parturition, more especially when the fœtus has arrived at maturity; but unless an opportunity of early examination be afforded, the state of these organs will not furnish decisive evidence of recent delivery, since trivial relaxation of them is an invariable attendant on menstruation alone. The lochial discharge is among the most certain signs; but we are told that it may be mistaken for the catamenia, and for leucorrhœa; the thing however is impossible, where a practitioner of experience is employed; for it possesses an odour so peculiar, that no artifice can conceal it. Moreover, during the first week at least, its colour is so dissimilar to the other effusions, that no mistake can arise. When a woman has in reality been delivered at the

* Humboldt, in his Travels in the interior of Africa, mentions, that he saw males giving suck. Baudelocque, in his first volume of Midwifery, relates the case of a girl eight years of age, who suckled an infant for a month. In a communication which I had from Dr Steinthal of Berlin, in 1821, he gives an account of an old woman of sixty-seven, who nursed one of her grandchildren for six or seven months. The late Bishop of Cork mentions a man who on his wife's death, suckled her infant.

full time, the condition of the uterus for ten or fourteen days afterwards, will be such as to settle all doubts. The great volume of this organ, when examined through the parietes of the abdomen; and the unusual size and dilatation of its os and cervix, are changes which must be obvious to every practical man, and which cannot result, to the same extent, from any other state than pregnancy and recent child-birth. It is said that these latter conditions may be induced by the development of hydatids in utero. So far as I may be allowed to speak of these productions from my own experience, which, however, has not been extensive, having seen four such cases only, I must say, that this latter is not a valid objection; for in neither of these instances was the uterus by any means so much enlarged, nor the passage so much dilated, as would have resulted from pregnancy and delivery at the full time. When a plea of this nature is advanced in favour of a female, some of the hydatids should be produced, or undoubted testimony afforded that such were the productions which had been expelled. I have also been led to remark, that the uterine discharge, under such circumstances, is not only more watery from the first, but disappears earlier than the ordinary lochia, and is at no period attended by the intolerable fetor, which accompanies that effusion. The presence of the so called "uterine hydatids" are, however, a certain proof that the woman has been impregnated, as by recent careful investigation it has been found, that these "hydatids" do not at all correspond to the animal of that name, found in other parts of the body, as it is proved that "uterine hydatids" are merely a dropsical state of the villosities on the chorion of a blighted ovum.*

When in any case doubt arises in consequence of the time which has been allowed to elapse before an investigation has been instituted, the medical jurist must not depend on any single sign, but carefully examine in connection all those which have been enumerated; and if an infant cannot be produced, nor evidence found that the accused had reported herself affected with dropsy, nor had been taking medicines to disperse it, we must lean to the side of mercy, or decline giving an opinion, as the examination has been too long delayed.†

It may be asked, what is the latest period at which an

* Granville on Abortion, p. 12.

† A decision exactly similar, enabled Petit and Louis to save an innocent person from execution, 1767. A young woman, while under the influence of the catamenia, received a fright, which led to obstruction of the secretion. Her abdomen became larger, and she was considered to be labouring under

examination of the parts would enable a practitioner to give a decided opinion as to the guilt of the accused? This varies not only in the different ranks of life, but in the same female in her various pregnancies: the medical jurist must be regulated, in some measure, by the habits and constitution of the individual. In stout vigorous females of the humbler classes, the organs are so rapidly reduced to their primitive state, and the powers of the patient so quickly restored, that no external examination could be relied on at the end of fifteen days; while the investigation of the passages, even after this short lapse of time, would afford but very doubtful results. It has been settled by most medico-legal writers, that the eighth or tenth day are the latest periods at which an investigation can lead to a determinate decision and Sacchias expressly states, that the proofs of delivery, become uncertain after this date; but from many opportunities, I certainly do think that even in healthy individuals, the time may be extended to fifteen, or to a longer period, indeed, in females of a lax delicate habit. In the following case, where no doubt could exist of the guilt of the accused, she escaped detection and punishment, little more than a month having passed away, betwixt the date of her delivery and that of her apprehension. Between six and seven, on the morning of the 11th of June 1809, Aimée Perdriat quitted her service, and betook herself to a friend, named Rosine, who occupied a lodging on the fifth story of a house in Paris, where, in consequence of indisposition, she requested permission to remain. About an hour after her entrance, a neighbour in the third story heard an unusual noise in the pipe leading from the commode, which caused her to apprehend it might be burst by what had passed through it. On the 17th of the same month, the drain of the necessary was opened up by legal authority, and the body of a child come to maturity, with its placenta and bloody cloths, found therein. On examining the fœtus, there were no signs of violence, but it was ascertained to have breathed, and its funis to have been broken or torn. This woman had not been visited by any

dropsy. While in this state she married, with a view to restore the menses. Some little time thereafter, nature accomplished what medicine had failed in, for there issued, per vaginam, a large quantity of fœtid matter, and the abdominal tumour disappeared. Coeval with the dispersion of the supposed dropsy, two dead infants were exposed, and this young woman, owing to the change in her appearance, was arrested as the parent. She was examined in a month after the escape of the retained catamenia, and declared by a physician, surgeon, and too midwives, to have been recently delivered. On an appeal to the same court, however, she was acquitted after two consultations of several physicians and surgeons. Foderè, vol. i. p. 276.

one except Rosine and another young girl, who entered her room merely to enquire if she needed any thing. At eleven o'clock, bloody marks were observed by Rosine on the stair, on the floor of the apartment, and on the seat of the commode, which the woman feigned to have arisen from her having a profuse flow of the catamenia. About two o'clock, the mistress of Aimée had her conveyed in a carriage to her own house. Suspicion was excited, and Aimée arrested on the 1st of July, but not examined till the 15th, 17th, and 27th of this month; when she was visited by several veteran accoucheurs, especially Baudelocque and Dubois, the latter of whom declared that she had not been delivered one month, nor even three months previously.*

When a female dies in child-bed, dissection will elicit further particulars, which, in a case connected with infanticide, may lead to the most important disclosures. If death has happened in consequence of hæmorrhage during labour, or immediately thereafter, the uterus, as it contracts little, will be found to constitute an immense flattened ovoid pouch, from ten to twelve inches in length, and to contain portions of the decidua, sometimes coagula. When death happens within the first week after parturition, the uterus will have regained somewhat of that pyriform shape which distinguishes it in the unimpregnated state, and its volume will exceed that of a Florence flask; at the end of a fortnight it will still be about six inches in length. Its internal surface will be dark and pulpy, as if it had been gangrenous, conditions which are induced by the decidua in a state of dissolution, and its aperture will be large, jagged, notched, or puckered. The point to which the placenta was adherent is to be distinguished from every other part by its appearing of a deeper colour, extremely rough, and bearing some proportion in circumference to that of the mass itself. It is of the greatest importance to remember, that the mark produced by the insertion of the pedicle of a collection of hydatids, may be taken for that of a placenta, because, as already stated, uterine hydatids are a disease of the chorion, and they are, therefore, a proof that a true conception, and consequently a placenta, were at one time present, and thus the placenta really forms the bond of attachment between the hydatids and the uterus; as this disease generally destroys the ovum at an early period, it accounts for the smallness of the placenta,—the pedicle of the hydatids.

Careful dissection will trace the muscular fibres of the

* Foderè, vol. ii. p. 18.

uterus, which will still be large. The round ligaments will be found much thickened, and the area of their vessels greatly increased. For a week or longer after delivery, so turgescent a state of the floating extremities of the Fallopian tubes is observed, as to lead those who are not aware of this circumstance to suppose, that the organs are in a condition approaching to inflammation; but it is merely their natural appearance. A corpus luteum being found in either ovarium is another sign of pregnancy, and that on which the greatest reliance can be placed, provided the observer fully understands the distinction between them and the false corpora lutea, previously described. The uterine tube corresponding to that ovary which displays the most distinct evidence of a corpus luteum, is not only more vascular, but also more capacious than its opponent, and it may sometimes have upon it an irregular dilatation, termed the "antrum tubæ." Among the changes induced by pregnancy, we find considerable diminution of the broad ligaments. In the substance, and on the inner surface of the abdominal parietes, certain peculiarities are to be discovered which will assist the medical jurist. The recti muscles of the abdomen, which lie contiguous on each side of the linea alba, are found after delivery, or after the parietes of this cavity have been much distended, to be drawn so far towards their respective sides, as to be from two to three inches apart, or to form with each other, towards the centre, a portion of a circle, instead of being in contact as formerly. This separation of these muscles may be observed for at least a week after parturition. A broad, purplish, or brownish line, extending from the umbilicus to the symphysis pubis, has been strongly insisted on by some writers, as another distinguishing mark. The peritonæal surface of the parietes will be found corrugated similar to their external surface, as also the peritonæal surface of the uterus, and this may continue for a considerable period after child-birth, or for the remainder of life, after several deliveries.

Sect. IV.—*Pretended Delivery.*

The title of this article explains its nature; the sex announce to their acquaintances that they have become parents, though they have not been pregnant at all. In these cases, the object of the deception is to conciliate a husband who may be dissatisfied with his better-half for being barren; or the imposition may be practised with a view to the surreptitious retention of property or honours, which, without

an heir, would ultimately revert to other relatives. Such cases are heard of in Europe only, where estates are entailed. In France, the law ordains, that persons who substitute one child for another, who conceal an infant, or who pretend that a child has been born, be imprisoned; but in former times, infamy and banishment were awarded against individuals guilty of such malpractices.

In 1772, a female in Paris, who was barren, determined on conciliating the affections of her husband by affecting pregnancy; and when the time arrived at which the pretended delivery was to be expected, she procured, by the assistance of a midwife, an infant from one of the hospitals in the town. The parents of the child, however, repented their conduct, and took steps to discover it, which led to a full disclosure of the affair. The pretended mother, besides suffering other indignities, was ordered to be banished for life from Paris. The midwife was condemned to fine and imprisonment.*

Cases of this nature present themselves under two points of view; *first*, Where the individual who pretends has never been pregnant; *secondly*, Where the feigned pregnancy and delivery have been preceded by one or more real deliveries. In the *first order*, the signs of recent delivery will enable a practitioner who is conversant in obstetrical matters to detect the imposture. Dr Male† relates a case of this kind which occurred some time ago to a surgeon in Birmingham. He was called to a pretended labour, and a dead child was presented to him; but the people had forgot to preserve the placenta, which induced this gentleman to examine per vaginam, when he discovered, that neither this canal nor the os uteri had been at all dilated. Before he had time to make further inquiry, however, the deception was acknowledged: the woman confessed that she had been impelled to this subterfuge to appease her husband, who frequently reproached her for being barren.

In the *second order* of cases, deceit may be more easily practised; but here also, a proper knowledge of the signs of recent parturition, when an opportunity of investigation has been afforded within ten days of the assumed delivery, will disclose the truth. As corroborating circumstances, we must take into account, whether the woman has been previously barren or not, also her age; and whether her husband is aged, decrepid, or a valetudinarian. Somewhat allied to these cases, are those where a woman has been delivered of

* Foderè, vol. iv. p. 406.

† Male, p. 212.

a dead child, and substitutes for it a living one, or where she has brought forth a female, and substitutes for it a male, but these scarcely belong to the province of the accoucheur, as the delivery of the woman is admitted or proved, and the question is, as to the identity of the child.

CHAPTER XVII.

PECULIARITIES OF THE FŒTUS AT BIRTH.

The head, in point of size, is among the first peculiarities to command our attention. The circumstance of its gravitating in most cases during gestation, has been supposed to favour the determination of blood towards it, and consequently to increase its size. Such an explanation, it may readily be supposed, cannot be received in the present day, since the same thing is observed in the fœtus that has been placed in a sedentary position during gestation; as also in the young of the quadruped, which are situated horizontally in utero. By some of the French philosophers, this increased development is ascribed to the head being supplied with purer blood than other parts of the body, a doctrine which has been noticed in connection with the fœtal circulation. It seems more consonant with reason and common sense, to consider the early development of the head and of its contents, as ordered by an overruling hand, it being necessary that such organs as are of most importance in the animal economy, should attain perfection earlier than those which are subordinate.

The bones of the cranium are soft and pliant at birth, have slight intervening spaces, and are connected by strong membranes. At first the bones are membraneous, and the brain is soluble in a solution of potass. By degrees this latter organ is covered by cartilaginous laminæ, in which ossific matter is progressively deposited. The head of a male is about a thirtieth part larger than that of a female, and they also differ in shape; the former is less round, but so much flatter at the sides than the latter, that frequently the sex of the child may be predicted before its expulsion. Several parts of the cranium are not perfectly ossified at birth. The most defective point is the centre of the coronal suture. The extent of this opening, and the age at which it becomes completely occupied by ossific matter, varies in different children: occasionally, there is scarcely any deficiency; but where there

is, it is generally made up by the end of the second year. The various conditions of the cranium exert a material influence on the duration of parturition, and on the sufferings of the patient. Its division into portions, the pliancy of these and their capability of approximation, or of sliding over each other, all contribute to diminish the volume of the head, and to abbreviate the duration of parturition; while from premature ossification of the bones, they are less easily moulded to the pelvis, whereby the sufferings of the parent are increased, both from the pressure which is exerted on the maternal structures, and the protraction of labour.

At birth the bones of the fœtus are all more or less cartilaginous, except the ossicula of the internal ear, which are generally fully ossified at this period. The meatus externus is cartilaginous, and is connected by its extremity to an imperfect circle, within which the tympanum is received. A mucous membrane lines the external meatus and tympanum, but disappears soon after birth.

The external genitals in the female fœtus are much developed; and in some instances the clitoris is so large that an examination is required to determine the sex of the child.

The surface at birth, appears of rather a bluish tint, from the little difference which exists between the blood circulating in the arteries and that in the veins; but when respiration is established, this bluish colour is exchanged for a bright red. Frequently the whole surface is covered with a thick coating of unctuous matter, which Lobstein* considers as a secretion from the glandular follicles of the cutaneous tissue, and as existing in the latter months only. Though it feels unctuous, it does not, however, deliquesce; but on the contrary, dries when exposed to heat; and with soap or butter, forms a matter which is miscible with water or spirits.

In the thorax, some important peculiarities present themselves. The cavity itself is more contracted before than after birth. In females, it is wider from the upper part to the fourth rib, than in males; but below this, it becomes narrower. Between the layers of the anterior mediastinum is placed the thymus gland, which in the fœtus is large, possesses a central cavity termed the *reservoir*, containing a white fluid "like chyle, or cream with a small admixture of red globules;" but after birth it gradually diminishes in size, and in the adult has entirely disappeared. The lungs are small, dense, and of a dark purple colour. A material difference is observed between the fœtal and adult heart. In the

* Nutrition du Fœtus, p. 99.

first place, there is a direct communication between the auricles, which enabled the blood to flow from the right to the left, by an opening termed *foramen ovale*, which generally becomes obstructed soon after birth. A *second* peculiarity, connected with this organ, is the communication between the aorta and pulmonary artery, already mentioned as the ductus arteriosus. Soon after birth it becomes impervious, and merely a ligamentous band remains, running from the pulmonary artery to the aorta, beyond the left subclavian; thus soon after birth the blood ceases to pass through the foramen ovale and ductus arteriosus.

In the abdomen several peculiarities are found. Externally, the cavity is more prominent in the female than in the male fœtus; and in the former also, there is a greater projection of the symphysis pubis. The stomach is smaller, comparatively speaking, than in the adult, and is said to contain some gelatinous matter having an acid re-action. The appendicula vermiformis, as well as the intestines, are longer in proportion, than some time after birth: when first visible, they are redder than they seem afterwards in the healthy state, and appear like a bundle of threads proceeding from the stomach. In the former is found a dark greenish viscid matter, with an admixture, in their upper half, of mucus. This production is the meconium, which owes its dark colour to some portion of greenish resinous matter secreted from the liver. This last organ is of great size, and is the principal cause of the tumidity of the abdomen in infants. It is early seen, and grows rapidly till the fourth month, when its development becomes more tardy. Both before and after birth it contains a large quantity of blood, which, during the former period, approaches more to the nature of arterial; but during the latter, it is principally venous, and affords the biliary secretion. The vesicula fellis is pretty well distended with a greenish fluid, which contains no picromel, and is therefore destitute of that bitter taste which characterizes the contents of this organ after birth. Various functions have been ascribed to the liver: the formation of the red globules, by Prevost and Dumas; its constituting a reservoir for the blood, until the lungs were able to receive it, by Mr Bryce; the depriving the blood of carbon and hydrogen, by Fourcroy; and the formation of the bile, by St Hilaire; Müller agrees with Fourcroy and St Hilaire, with the addition, that the liver also separates fatty matters from the blood; Dr Lee thought that the liver secreted albumen, but the idea is too absurd to require consideration. The umbilical vein, in advancing towards

the liver, gives off a branch termed ductus venosus, which joins the ascending cava. The former soon after birth becomes impervious, and forms the round ligament of the liver, and the latter a fibrous band which may be traced from the liver to the vena cava.

The pelvis is so contracted in early infancy, that all its viscera, except the rectum, lie either on the brim, or actually in the abdominal cavity. The kidneys are lobulated, but are not much larger than the glandulæ renales, which gradually diminish in size after birth. In shape, the vesica urinaria is oblong; and when distended, its fundus rises above the umbilicus.

CHAPTER XVIII.

PRIMARY CAUSES OF RESPIRATION IN THE FŒTUS.

Previous to birth the lungs are dense and collapsed, their cells are compressed, and contain no air. Unless the head has been long and greatly compressed during parturition, whenever it is excluded, or the face is partly exposed to the air, the organs of respiration are roused from their state of quiescence, and the child cries; or, if it does not afford this evidence of the lungs having commenced to act, and the body is expelled, an alternate elevation and depression of the parietes of the chest are observed. The fœtus has been heard to cry in utero, but I have never heard it, and it is doubted by many of the profession; yet as I have been assured of it by my highly esteemed friend, the late Dr Duncan junior, I feel myself justified in giving to it full credence; this, however, has never been known to happen unless there has been some manual interference on the part of the practitioner, as where the head was in the vagina, and the fingers of the accoucheur in the mouth of the fœtus, or where the hand has been introduced into the uterus to turn. As the infant rarely, however, affords the foregoing unequivocal evidence of respiration until after birth, it is an obvious conclusion, that from the influence on some of its tissues of the element in which it is now placed, must be derived the first impulse that is given to the action of the lungs.

Various hypotheses have been offered regarding the primary causes of respiration. 1*st*, It was thought that atmospheric pressure alone was sufficient to enable the air to

distend the lungs of the fœtus, because before birth they do not fill the thorax, and there is thus a vacuum in that cavity. This formed the first inspiration, and the inherent elasticity of the pulmonic textures, driving the air out again, formed the first expiration. If this mechanical theory held good, the lungs of every fœtus, be it dead or alive, would be distended with air, but when we speak of infanticide, we shall see that the lungs of the fœtus, which has died shortly before birth, contain no air. 2*dly*, It has been supposed by Müller, and he has performed numerous experiments to confirm his idea, "that the cause of the first respiration is the impression made on the medulla oblongata by the arterial blood, which is formed in consequence of the first entrance of air into the respiratory organs."* This sentence contains a manifest inconsistency, as the blood could not be arterialised until respiration had commenced, and with all due deference to so high an authority, it does not at all account for the origin of respiration, although it may aid in accounting for the continuance of that function when once established. 3*dly*, Respiration has been supposed to take its origin as a reflex movement, consequent upon sensations in the respiratory organs, these sensations being caused either by the presence of air, or of unoxygenised blood, and thus a sense of want of air in the lungs; but the first of these ideas cannot be entertained, because air could not be present in the lungs until one inspiration at least had taken place; the second cause, however, may have some influence, as the placental circulation—the means which the fœtus had of being supplied with arterial blood—is cut off. 4*thly*, It has been thought that the altered position of the abdominal viscera after birth, drew the diaphragm downwards, and thus the lungs expanded, but this will not account for it in cases where the breech presents, as in them the abdominal viscera have been for some time below the diaphragm. *Lastly*, The most generally received opinion is, that the stimulus of the external air, acting on the nerves throughout the whole cutaneous surface, excites the medulla oblongata, and thus gives rise to respiration as a reflex motion. This is obvious from many facts well known to practitioners, as for instance, we know that generally speaking, no sooner is the head born than there is a gurgling noise in the child's throat; this becomes louder as the body is expelled, until it ends in a cry as soon as the child is wholly born, and this more particularly if the atmosphere is cool, and the bedclothes somewhat

*Müller, trans. by Baly, vol. ii. p. 919.

raised; we know too that nothing is more efficacious in recovering asphyxiated infants, than rubbing the face, chest, and back with something which evaporates quickly, as aqua ammoniæ, ether, or alcohol, also the practice of pouring cold water on the same parts, a custom followed with much success by Professor Nægelè,—and Dr Schöler of Berlin has even employed the cold plunge bath with benefit for the same purpose; and this is confirmed by the well known fact, that cold water or air coming suddenly in contact with the body, gives rise immediately to a deep inspiration.

The inference from the foregoing facts must be, that the primary cause of respiration is the stimulating influence of cool atmospheric air upon the branches of the portio dura distributed upon the face and throat, these being the first surfaces to experience the influence in question. By the researches of Sir C. Bell, we find that there are several other nerves besides the portio dura intimately connected with the function of respiration, as the glosso-pharyngeus, the pneumogastric, the nervous accessorius, and the phrenic, all these are connected with the pneumogastric,—the sensitive nerve of the lungs. It is found that when this nerve is divided above the origins of the superior laryngeal nerves, the muscles of the glottis are paralysed, and cannot dilate that opening, and thus the supply of air to the lungs is diminished; 2*dly*, Respiration becomes slower, and the passage of the blood through the lungs is retarded; and, 3*dly*, The bronchi and their branches become clogged with a thick tenacious mucus, probably because the ciliary motion on their mucous membranes is paralysed.

For the foregoing reasons then, we may conclude, that the sensation excited by the application of the cool atmospheric air to the cutaneous surface, and the want of arterialised blood in the fœtus, may both contribute to cause a movement of the respiratory muscles as a reflex motion; generally then, as soon as the infant is born, the ribs are raised by the action of the intercostal and other muscles. The thorax is dilated, and the diaphragm, instead of forming an arch over the abdominal viscera, is now converted into a plane, whereby the chest is still further enlarged. The atmospheric air, from the moment the fœtus has been transferred into this element, presses over its whole surface, and by its gravity, forcibly rushes through the mouth and nostrils into the trachea, distends the lungs, and thus constitutes inspiration, which is the first act of respiration. Though the ambient viscera must suffer compression from the condition of the lungs, yet the circulation through the substance of these organs

cannot be impeded, since the action of the heart is much more powerful than the pressure opposed to it, and the lungs themselves receive a large supply of blood.

After the muscles which are concerned in the first act of this function have contracted, they show a disposition to resume their former state, whereby the thorax is again contracted, and the contained air expelled, which constitutes expiration, the second act of respiration. The principal agents in this last part of the function, are the oblique, recti, and transverse muscles of the abdomen, which react upon, and assist in drawing down the ribs.

Another subject intimately connected with this, and equally intricate, is the cause of the rhythm of the respiratory movements. The regular alternation of inspiration, and expiration, were thought to be excited by the sensation of a necessity of expelling the carbonic acid from the lungs, and taking in pure air, but it is evident that this cannot be the cause, since during sleep, and when both pneumogastrics are divided, when such a sensation cannot be excited, the rhythmic movements of respiration still continue. Müller believes, that "in consequence of the continual excitement of the medulla oblongata by arterial blood, therefore a periodic discharge of the nervous influence upon the nervous fibres, alternately of the inspiratory and expiratory muscles takes place; the excitement of one of these sets of muscles to action being followed as a necessary consequence, by the antagonistic excitement of the other set."

CHAPTER XIX.

MEDICO-LEGAL SUBJECTS CONNECTED WITH THE FŒTUS.

We have as yet treated only of the medico-legal subjects connected with the parent, and we come now to those in which the fœtus is concerned: they are of equal interest and importance with those already considered, and although ostensibly connected with the fœtus only, the reputation and life of the mother are frequently deeply interested in the issue of their investigation.

Sect. I.—*Viability of the Fœtus.*

The meaning of the term viability, is the *apparent* capability of the fœtus being reared and continuing in life to the

ordinary term of human existence. The establishment of a child's viability, may enable a husband to succeed to his wife's property, as his child's heir, as it is technically termed "a tenant by courtesy." An excellent illustration of this is given in the case of Fishe *v.* Palmer, by Dr Beck.* The viability of a child may, under certain circumstances, be brought forward as a subsidiary point to establish its bastardy, thus, if a woman be married on the 1st of January, and on the 1st of May of the same year she bears a child, which continues to live, it may be asserted that because the child is viable, *i. e.* is reared, that it must have been begotten previous to marriage, by its mother's husband, or it may be by another person.

In England, any sign of life is sufficient proof of a child's viability; in Scotland it is necessary that the child cry; this is undoubtedly the best sign of its present life, but not of its fitness to continue in being; in France and Prussia the term viable means more than merely capable of being reared, as legitimacy and the right of succeeding to property is also involved in it; thus in France, if a child is born before the 180th day, and in Prussia before the 210th day, it is considered not viable, and can acquire no property though it live to the age of 50; and thus a man may be really viable though he is not legally so, and is looked upon as if he had never been—*a partus vivus non vitalis.*

Hippocrates in his work declared that few seven months' children were ever reared, and that of eight months none ever continued to live, this (being somewhat of an astrologer) he ascribed to the "nature of numbers." As not the most minute examination of the fœtal organs will tell us whether a six months' child is capable of being reared or not, provided no monstrosity exists, we must have recourse to the recorded experience of others, to determine what is the earliest period at which we have unequivocal evidence of a child being reared. It has been the custom to place considerable reliance upon the case published by Dr Rodman of Paisley, but the accounts furnished regarding it are so exceedingly meagre, and so very unfavourable to the supposition of the infant being one of only nineteen weeks' gestation, that I am not inclined to attach much importance to it; thus Dr Rodman informs us that three weeks after birth the child weighed one pound thirteen ounces avoirdupois, and measured thirteen inches in length; so that this child at the twenty-second week weighed five times more than children

* Beck's Med. Jurisprudence, p. 198.

of the fifth month, and measured twice their length; and during the three weeks immediately succeeding its birth it laboured under circumstances which, far from tending to accelerate its growth, would have quite the contrary effect; and all the other particulars mentioned by Dr R. would be met with in premature children equally, of the fifth, sixth, and seventh months; it is evident, therefore, that there must be some error in this case, or that Dr R. was imposed upon.

The case of earliest viability of which the fullest, most perfect, and unequivocal evidence is afforded, is that related by Mr Tait.

"A woman married on the 22d July 1839, menstruated naturally the week before her marriage, and felt herself quite well only two days before that event, but the menses had never afterwards returned. On the 18th January 1840, she was delivered of a female child, which was born alive, but was so feeble, and so premature in its whole appearance, that the question of its viability was never once entertained; its cry was so weak as scarcely to be heard a few yards distant, and more resembled the mew of a kitten than the natural cry of an infant. There were no nails on its fingers and toes; a thick dark down covered the head instead of hair; the skin everywhere was unusually florid and thin, and the extremities imperfectly developed; the bones of the head were soft and easily compressed, and their approximation at the sutures was imperfect. The *membranæ pupillares* were entire. Notwithstanding these premature appearances, every care was taken to preserve the child alive, by wrapping it in soft cotton wool, &c., and keeping it in a basket beside the fire; it was so feeble as to be unable to grasp the mother's nipple, and was nursed during the first three weeks by milk taken from the breast, introduced at first by a quill, and afterwards by a teaspoon. Before it began to suck, it was so shrivelled and covered with down similar to that on its head at its birth, that several professional friends who saw it declared that it would not live, and were surprised that it had survived so long. So soon, however, as it began to suck, its whole appearance began to alter, and it became an object of great interest and anxiety, and its length and weight were for the first time accurately taken on the 27th February, being forty days after its birth, and were as follows: viz. weight, three pounds; length, thirteen inches; centre of the body nearly an inch above the umbilicus. On the 16th March the child was measured, when its length was fully thirteen inches and a half; weight, three pounds ten ounces and a half; centre of the body three quarters of

an inch above the umbilicus. April 11, weight five pounds three ounces; length, seventeen inches, centre of the body at the superior margin of the umbilicus. The nails are now formed on the fingers and toes; the aspect is more natural than hitherto; the down or hair has almost entirely disappeared from every part of the body. From the above period it continued to thrive well until the 27th of May, when it was seized with measles, and died after two days' illness."* This case related by Mr Tait is most perfect in its evidence, and establishes the *possibility* of children being reared who are born before the middle of the seventh month of utero-gestation. It has been objected to Mr Tait's case, that the woman might have been pregnant before marriage, but we have no right to start such an objection where the evidence afforded by the appearances of the child corresponded exactly with what we should expect in one born at the conclusion of the sixth month. The next and last case which I shall relate is that detailed by Dr D'Outrepont, professor of midwifery at Wurzburg. "The mother, a young woman, whose catamenia had always been perfectly regular, was repeatedly connected with her husband, for some time after the cessation of their last flow. About a fortnight after this cessation of their flow she underwent a general change in appearance, and began to have frequent attacks of vomiting and fainting, symptoms which she never had in life before. The symptoms continuing, the catamenia did not return; and about twenty weeks after their last appearance she felt the first movements of the child. Five weeks after this, and twenty-seven weeks after the last appearance of the catamenia, she was seized with labour-pains, and a male child was produced, which breathed immediately on being born. It measured thirteen and a half inches, and weighed one pound and a half. Its skin was covered with smooth lank down, and was much wrinkled. The whole extremities were exceedingly small in proportion to the trunk, and were kept constantly bent over the body, as during the existence of the fœtus in the womb. The nails of the fingers and toes were like mere folds of skin; the testicles were still within the belly, and the pupillary membrane was entire. The child whined, but could not cry, slept almost constantly, awoke only once a-day, seldom opened its eyelids, and was obviously insensible both to light and sound. For some time it was fed with the spoon on diluted milk and sugar. In four weeks the down began to drop off

* Lancet, vol. ii. for 1841–42, p. 119.

from the skin. In fifteen weeks it had made very little progress in any respect. The wrinkles had disappeared however from the skin, and the length was increased an inch and three quarters. But from this time, which corresponded with the fortieth or forty-second week after impregnation,—that is, with the full period of utero-gestation,—it made rapid advances, sleeping less, eating more, crying strongly, and becoming evidently sensible to sound, and pleased with the light. When fourteen months old, it was of the weight and stature of a child born at the full time. In the eighteenth month the testicles descended into the scrotum, without causing him any annoyance. In like manner the teeth began to appear easily in his third year. He did not begin to walk till half a year later; and at that time he differed from other children of the same age, not only in littleness, but likewise in the singular oldness of his expression of countenance. When Dr D'Outrepont saw him in 1816 he was eleven years of age, and was as big as a boy of seven or eight." The evidence in this case is perfect, both as regards the date of conception, within a fortnight, and also as regards the appearances of the fœtus, unequivocally establishing the fact, that a viable child may be born at a less period than 190 days' gestation.* A case occurred to Dr Collins of Dublin, in which he believed the child to have been only six months and twelve days in utero; it was alive and perfectly healthy two months after birth. Professor Paul Dubois stated to me that he had met with an instance of a viable child, born after a gestation of only six months and a half.

These three preceding cases appear to me sufficient to establish the fact, that a viable fœtus may be born *before the middle of the seventh lunar month* of utero-gestation. Many other cases are recorded;† but in none of them is the evidence so complete as in those which I have detailed above, and therefore I do not think it worth while to dwell upon them. The chief source of doubt in cases of early viability, as well as in those of protracted gestation, is the acknowledged difficulty of fixing the precise date of conception. This will be easily understood when we come to consider the early signs of pregnancy.

If asked to give an opinion as to the viability of a child, we must base our decision chiefly on the consideration of its

* Hencke's Zeitschrift für die Staats Arzneikunde, vi. 19.

† Case for the Parishioners of Kinghorn, &c. In the evidence in this case will be found copious accounts of, or full reference to, all known cases of early viability.

absolute development, and the apparent fitness of its various organs to carry on their due functions, circulation, respiration, and digestion, as the greatest difficulty against which a prematurely born fœtus has to struggle for life is the adaptation of its respiratory and circulatory systems to its new mode of existence. In children of the sixth month we cannot point out any structural defect which would prevent their being reared, and though their viability is not impossible, it is certainly far from probable, their delicacy being such, that they rarely live forty-eight hours after birth; and the mere fact of a child living so many hours, or even days, is not sufficient to establish its viability, as monsters without a brain have been known to live twenty days after birth, and yet no one would consider them as likely to be reared. In our investigation as to the viability or bastardy of a child, the first object must be to ascertain, as far as possible, its precise age, *i. e.*, at what period of utero-gestation it has been born, and from this to calculate the date of conception. These points are to be determined by a knowledge of the signs of immaturity which the fœtus presents at the various stages of its development, and the signs of maturity which it offers when born at the full period of 280 days' gestation.

Sect. II.—*The Signs of Immaturity, and Maturity of the Fœtus.*

It is unnecessary for me to enter here into a long detail of the signs of immaturity which the fœtus presents, because they are merely the changes which take place in its different organs, as its development progresses, and these have been detailed at full length in the chapter on Embryology. To determine the age of a child then, the first points to be examined are its length and weight, the position of the central point of the body, the size of the head, the length of the hair, the dimensions of the fontanelles, the organization and development of the nails, the texture, density, and colour of the skin, the presence of fat, and the sebaceous coating of the skin; we ought then to observe the state of the various functions,—respiration, digestion, and circulation.

The length of the fœtus at various times, has been already carefully given in the chapter above referred to; at the full time it varies much, but the average is between eighteen and twenty-two inches. The weight has also been noticed, at the full period (280 days) that of the male was found on an average of nearly 7000 cases, to be six pounds and three quarters, and that of the female, five pounds and a half.

The central point of the body is situated, at the sixth month, on the ensiform cartilage of the sternum; at the seventh, between the ensiform cartilage and the umbilicus, but nearer the former, yet this varies much; in one case by Devergie, it was found only two lines above the umbilicus, in another an inch and a half above it; at the eighth month it is still nearer the umbilicus; and at the ninth month it is said to be situated at the umbilicus; by Moreau it is placed ten lines above it, and by Devergie seven; it appears to me that the position of the central point of the body is far from being so infallible a sign as is generally alleged. *The hair of the head* appears like down at the fifth month, and becomes longer until the ninth month, when it has been seen two or three inches in length, and that especially, if of a dark colour. *The head* in the fifth month is disproportionably large when compared with the rest of the body, but as the body becomes larger, this disproportion diminishes; *the fontanelles* are also very large, and wide in the early months, and the bones move with very great freedom on each other, but as the child grows older, the fontanelles become smaller, and the bones move with less ease, although they still overlap to a certain degree, with facility. In a fœtus at the full time, the average dimensions of the head are as follows: From the vertex to the root of the nose, four inches; from the vertex to the chin, five inches; from the one spheno-parietal articulation to the other, three inches six lines; the circumference round the superciliary ridges, and occipital protuberance, fourteen inches.

The nails begin to appear in the fourth month; are very distinct in the fifth, but are still red and fleshy; they do not yet reach the extremities of the fingers in the seventh; in the ninth, they cover the fingers to their points.

The skin in the fourth month, is reddish and dense; in the sixth, it presents fibres in its substance, and is covered with a white silvery down; in the seventh it is still reddish, but more fibrous, thicker, and generally much wrinkled; this gives to the features the expression of old age; at the ninth the skin is firm, smooth, at first bluish, but afterwards reddish, and then of the usual skin colour.

The fat is first observed in the fourth month, and gradually increases, and generally abounds in considerable quantities at birth. *The sebaceous coating* first appears in the seventh month, is well marked in the eighth, and generally abundant in the ninth; the changes in the pupillary membranes, eyelids, &c. have been previously noticed.

As to *the function of respiration*, a mature child breathes freely, and cries loudly; but an immature child breathes with diffi-

culty, as if it were about to be choked, or as if it required to rest, and recover itself before making a second inspiration, and instead of crying, it utters frequent low moans. With regard to *the function of the digestive organs*, the mature infant sucks vigorously, and passes meconium and urine soon after birth, but the immature infant cannot suck, perhaps not even swallow, and its bowels are moved with difficulty. As to the *circulation* in the mature child, the heart beats strong and quick, in the immature infant, feeble and slow; it is unable to maintain its own warmth, and requires to be carefully wrapped up and its heat maintained by various artificial means; it also sleeps almost constantly. Such are the differences which characterise the mature and immature fœtus, and by means of these together, with an examination of the degree of development of individual organs as above given, a tolerably accurate opinion may be formed as to its age.

Sect. III.—*History of Infanticide.*

By this term is to be understood, simply, the murder of the new born infant; but so nearly allied to the subject is fœticide, or the destruction of the fœtus in utero, that they have usually been discussed under one head. Whether we consider the helplessness or the innocence of those who are its victims, there is certainly no crime which can appear more unfeeling to a humane mind, or more calculated to call forth all the finer sympathies of our nature, than infanticide. Nothing, therefore, short of the desire to preserve in society the reputation of chastity, which constitutes the highest ornament of the sex, and which has often proved dearer to them than life itself, could be imagined to impel them to an act so unprovoked and so unnatural, as the murder of that inoffensive being, whose existence, under other circumstances, they would willingly sacrifice their own to protect. The accused, however, until her guilt is clearly proved, should rather excite our compassion than aversion; for she stands in a situation in which no other criminal does. The very circumstance of her being known as the mother of an illegitimate child, gives rise to suspicions which excite the tide of public opinion against her, whereby the case is prejudged. Though there is much reason to believe that this crime is still too familiar to the public, yet, from some of the causes which may lead to the death of an infant, either during parturition or after it, not being studied with that attention which their importance deserves, it is to be apprehended that cases of groundless accusation are not unfrequent.

The married, as well as the single, may be the authors of this crime, to conceal their guilt and infidelity from an absent husband. An example lately occurred where the object was to obtain thirty shillings of burial money for the dead child.

If the history of fœticide be glanced at, we find that few nations of antiquity were exempt from it. The Mosaic code is silent on the subject, from which we may infer, that the Jews were strangers to it, at least during the existence of their great legislator. They may have been deterred from it, on the one hand, by the severe punishments which were denounced against those who should be guilty of murder; while on the other, they had been afforded the most cheering inducements to avoid the commission of it, by having been forewarned that the Messiah should one day be numbered among their descendants. They did not long continue, however, to be an exception to other nations; for, as their intimacy with the Canaanites increased, they imbibed their habits, and polluted themselves with their worst crimes. These crimes were carried to a dreadful extent by the Canaanites, who immolated their sons and daughters to their gods. The Egyptians, desirous to prevent the increase of the Jewish male population, lest they should ultimately become their rulers, enacted the most cruel laws to effect this object, but towards their own offspring they conducted themselves with greater humanity. Strabo, in particular, eulogises them as an honourable exception to those nations who assumed the power of disposing of the lives of their infants. If we except Thebes, the unfeeling conduct of the Canaanites was more or less prevalent over the whole of the ancient world. I shall add only another instance: the Carthagians, who had a law by which four infants of noble family were regularly immolated upon the altars of Saturn, attributed their defeat by Agathocles, king of Sicily, to an omission of these sacrifices; and, in order to atone for their past neglect, they offered up at one time, two hundred of the sons of their nobility. The Spartan *was enjoined* by his law to toss his weak or deformed children into the caverns of Mount Taygetus; with him physical vigour was virtue—all that was worth living for. The Athenian writers make frequent allusion to the practice of infanticide; it was enjoined by Aristotle, and justified by Plato and Solon, probably to palliate a practice they were unable to check. It was reserved for Thebes, however, to set an example of humanity to the people that surrounded her; for by her laws, it was strictly forbidden to imitate those countries who were accustomed to expose infants at their birth. The Roman, too, was abso-

lute master of his children's life and death, and from the time of Romulus to that of Constantine they exercised their right with inexorable severity.

But this crime was not limited to, nor has it ceased with, the ancients. It has, unfortunately, been transmitted to modern nations, some of which, in the present age even, it still continues to disgrace. Among the Chinese, the prevalence of this horrid practice is incredible. It was stated by Mr Barrow, that in Pekin alone, the number of children exposed was about nine thousand annually. The Hindoos were equally addicted to it; but of late years, by the efforts of some of the British officers, it has been completely abolished in many of the provinces. In Otaheite, previous to its conversion to Christianity, the frequency of the crime was such, that it threatened the depopulation of the island. The natives of New South Wales, and a tribe of those of the Cape of Good Hope, termed by Mr Barrow, Bosjesmans, are addicted, the former to the procuring of abortion, and the latter, to the destruction of their infants, in various ways. To the latter, however, a good example was set by their former masters the Dutch, who are said to have been in the habit of shooting them, with as little ceremony as the wild game of the country. In the present day, the palace of the Sultan is not unfrequently stained with the blood of innocent victims. Thornton, in his account of the Turkish empire, informs us, that the offspring of the younger princes of the royal family, who are kept in confinement in the palace, for the throne or the bowstring as it may chance, are destroyed as soon as they are born. By the history of America, it would seem that infanticide was more or less prevalent over the whole of it. The crime does not appear to have been resorted to in any of those countries, from any ferocity natural to the people, but to appease the supposed wants of their deities, under circumstances of indisposition or misfortune in war; to save their parents the trouble of providing for their support; and to celebrate their success in arms, or the coronation of their sovereign. The Mexicans and other nations, restricted their sacrifices to prisoners taken in battle.

Sect. IV.—*Criminal Abortion, or Fœticide.*

Although this crime is generally limited to individuals who have been impregnated illegitimately, yet, I am not without a strong apprehension, that it is induced by married females for the sake of accommodation. What inferences

are we to draw when we meet with sensible individuals in society, whom the strongest representations are insufficient to deter from causes likely to produce it. It is doubtful whether the extraordinary notions which have been entertained by legal as well as medical professors, both in ancient and modern times, have not tended rather to the encouragement than the suppression of this criminal practice. Hippocrates supposed that a male fœtus was not animated until the thirtieth, while in the female, this was protracted until the forty-second day after conception. It was the belief of the Stoics that the soul was not united to the body until the act of respiration, and that the fœtus was inanimate during its residence in utero. The opinions of the moderns again must have been as injurious as they were absurd, by denying the vitality of the embryo until the period of quickening; and this absurd idea is still perpetuated; by the present law, 9 Geo. IV. c. 31, it is enacted that the use of means to procure abortion before quickening is only a misdemeanour, but after this period it is punishable with death as a felony. These ideas cannot be doubted to have had a dangerous tendency, by impressing the ignorant and unprincipled of both sexes, with a belief, that as the fœtus was not endowed with life before a certain time, the procuring of abortion, previously to that particular period, could not be viewed as a crime. The fœtus, however, possesses vitality from the moment of conception, although evidences of its animation are not for some time cognizable to our senses; in proof of which, it is no sooner distinctly visible in utero, than the pulsations of the heart can be distinguished; on the seventeenth day from its transference to that cavity, it contains blood; and an embryo has been seen to move its limbs a considerable time before quickening; and it requires no proof or argument to show that it would be morally as felonious to destroy an ovum at the moment of conception, as a fœtus at the full time.

The detection of fœticide, unless the investigation be speedily undertaken after the crime has been committed, is attended with unsurmountable difficulties; for, in twelve hours afterwards even, there is little hæmorrhage; and in a shorter period still, no relaxation of the external genitals can be traced. So late as the third day, an unusual dilatation of the os uteri may be distinguished; all this, however, depends on the age of the ovum; but when other proofs cannot be obtained, we are unable to determine during life, whether this condition of the aperture may not have arisen from the transit of a mole, or a small collection of hydatids;

the sex may say that the body thrown off was a false conception, a term with which many of them are acquainted and know the import; but if it cannot be produced, or good testimony in support of this statement, the inference must be unfavourable to the accused. The proofs of expulsion of the uterine contents after the fifth, or in the later months, present little ambiguity. These, as well as the appearances on dissection, the reader will find detailed in the section on Concealed Delivery. These symptoms, however, will merely prove that abortion has taken place, but not whether it has been induced criminally or accidentally; we must therefore attempt to discover whether there are any signs of violence having been done to the person, or of such drugs having been administered, as are by the vulgar believed to possess the power of producing abortion. In this section I shall consider only the artificial means employed to procure abortion; the natural causes will be described in another place.

To induce fœticide, the expedients resorted to may be divided into *local and general.* Both of these may affect the uterine system either directly, or indirectly. A local cause, such for example, as some mechanical contrivance, may, by a person acquainted with the structure of the parts, be conveyed into the uterus, and the ovum destroyed, without such a mode being succeeded by constitutional derangement; but more frequently, attempts are made to attain the same end in a less scientific manner, and severe general disturbance sooner or later ensues.* The causes which may be included under the second head, as the exhibition of some of the more active agents of the materia medica, invariably exert their primary influence on the system of the parent in general, and the uterus is sympathetically affected. The ultimate *modus operandi* of both sets of causes is to destroy, either from the first, or eventually, the union between the ovum and the organ which contains it, whereby the development of the former is arrested; and the latter is prematurely excited to dislodge its contents.

The local causes will be first considered, and of these two only can be particularized, viz. blows either on the loins or on the anterior part of the abdomen; and the introduction of some contrivance into the uterus, to rupture the membranes, or in some other way irritate that organ. Except where some predisposition to abortion exists, much severe pressure may sometimes be exerted on the abdomen without

* That which was alluded to in the trial of Angus for the murder of Miss Burns, was described as a silver tube with a slide, at the end of which was a dart with three points. Dr Smith, 306.

either exciting the action of the uterus or injuring its contents, in consequence of the plastic structure of the organ, and the uniform support afforded by the contained fluid to its inner surface, as also the additional protection which it receives from the abdominal parietes. In the summer of 1823, I was called on by a person whom I afterwards ascertained to be a procurer of abortion, and who requested I should take charge of a young female in a state of pregnancy, and that I might have the child myself. I inquired if the infant was dead, and was answered in the negative, but that the necessary steps had been adopted to destroy it. On visiting the woman I found the fœtus alive; she stated that it was illegitimate, and her first. After warning her against what I had heard, she confessed that she had repeatedly suffered herself to be violently struck over the abdomen; to have some strong liquids, as ale and porter, injected into the vagina; and the os uteri scratched with a stocking wire. She was delivered in due time of a healthy living child. Such freedom cannot always be used with impunity, for the fœtus is very generally destroyed; and the like violence frequently also involves the life of the mother. Dr Smith relates the case* of a man who was executed at Stafford for the murder of his wife. She was in a state of pregnancy at the time, and he succeeded in causing abortion by elbowing her in bed, rolling over her, &c., which proved fatal to her. In April 1822 I was called to a woman in the last month of pregnancy, who had been struck on the abdomen by her husband. An extensive detachment of the placenta led to the immediate death of the fœtus, and to that of the mother, in fifty-one hours afterwards.†

Sometimes it may be disputed, whether the cause assigned may have had any share in producing the abortion; in which case it becomes necessary to determine, in the *first* place, if the injury has been sufficient of itself to cause it; and in the *second*, if the complainer has neglected to adopt those precautions which had been recommended to her to prevent premature expulsion. The following cases from Belloc‡ may assist a practitioner in his decision. A young woman, between the third and fourth month of pregnancy, had received, from a robust man, several kicks, and blows with the fist, the marks of which were evident. Immediately after the accident she was put to bed, was bled, and had various remedies given her by a surgeon. The hæmorrhage, however, continued, with pains in the loins and abdomen, and the

* Dr Smith's Principles of Forensic Medicine, p. 305.
† Author's Work on Puerperal Fever, p. 205.
‡ Beck, p. 148.

following day the ovum was expelled. In his examination, Belloc declared that the accident was the result of the violence inflicted. In a second instance, a woman gave birth to a dead fœtus of the fourth month, two days after having been struck, in a dispute with her husband. Instead of betaking herself to bed, or at least keeping quiet, she walked a league that day, and on the next a quarter of a league, when she was at last compelled to go to bed. In this case, Belloc decided that it was very possible had she remained quiet, and called for proper assistance; the abortion might not have taken place.

On the iniquitous practice of introducing instruments into the uterus, little need be said, since it must already be too well known. I shall therefore merely add the history of two cases in which it proved fatal to the fœtus and to the parent. At the Durham assizes, in 1781, Margaret Tincler* was indicted for the murder of Janet Parkinson, by inserting pieces of wood into her womb. The deceased took to her bed on the 2d of July, and from that period thought she must die, using various expressions to that effect. She expired on the 23d. During her illness she declared that she was with child to a married man, who advised her to place herself under the care of the prisoner, as she was a midwife, and would assist in relieving her of the child, which was then between the fifth and sixth month. Three days previous to the birth of the fœtus, which happened on the 10th of July, the prisoner took the patient around the waist, and shook her in a violent manner five or six different times, and tossed her up and down. The child died instantly after birth, and was proved by surgeons to have been perfect. On examining the uterus, it appeared perforated at two points by wooden skewers; one of the openings was inflamed, the other gangrenous. Additional evidences of injury were also discovered. In the April No. for 1825, of Med. Chir. Rev. Lond. is copied the following case from the Gazette de Santé, for Nov. 1825. Messrs Foderé and Ristelhueher having repaired to the house of the deceased, on the 7th March 1822, they found the body of Cathrine S. extended on a table, and already exhibiting marks of incipient putrefaction, although death had taken place only the preceding day, after a short illness. On examination, there was nothing particular observable on the chest. In the abdomen, the peritoneum was inflamed, and some spots of inflammation on the mucous membrane of the stomach and bowels. In the neighbourhood of the

* Dr Smith, p. 306.

uterus, there was a sanguineous effusion, with some clots of blood, in the midst of which was found a fœtus of about sixty days' growth, with its umbilical cord. The womb was flattened, red, and inflamed. On more minute examination, it was found to be ruptured, the opening being about the size of a three-franc piece. The internal surface of the uterus was also inflamed. The membranes of the fœtus were found perforated in two places, near the cervix uteri, and opposite the rupture in the parietes of the uterus, through which the fœtus had escaped into the abdomen. Nothing remarkable about the external genitals. The medical commission called before them and examined some witnesses, by which it appeared that a midwife had been closeted with the deceased, a day or two previous to her death, and made use of a syringe with a long ivory pipe, which instrument was produced. Shortly after this interview, the deceased discharged a quantity of black blood from the vagina, and was seized with excruciating pains, which continued till death took place. From these data, the reporters came to the following conclusion; viz. *first*, That the deceased died of a violent inflammation, with rupture of the uterus, followed by expulsion of the fœtus into the abdomen. *Second*, That this inflammation and rupture being rare accidents, and not likely to take place, except as the effect or consequences of a grave malady, in the last stage of utero-gestation, it was probable that they were, in this instance, the result of violence, from the forcible introduction of the pipe of a syringe into the os uteri, and the injection of some acrid and stimulating liquid into the cavity of that organ. The jury found the midwife guilty, and condemned her to ten years' imprisonment.

The causes which are thought to act on the general system, will now be considered. These are venesection, cathartics, emetics, diuretics, and emmenagogues. The opinion that venesection, when copiously directed, induces abortion, especially if the blood be drawn from the foot, is as ancient as the time of Hippocrates; but the best refutation of such a notion is, that it is a remedy in daily use, and found most efficient in preventing the accident. Profuse evacuations of blood certainly occasion great irritability of system in the gravid state, and may in this way lay the foundation for a predisposition to premature evacuation of the uterine contents. It must also, I presume, be well known to every practical man, that if the uterine derangement amount to a partial dilatation of its aperture, so large a detraction of blood as shall have the effect of producing deliquium, will as-

suredly be speedily followed by the expulsion of the ovum. Where no tendency to expulsion exists, venesection will not excite it. No doubt, if a woman were brought extremely low by the practice, the system would be incapable of furnishing sufficient materials for the development of the uterus, and the premature expulsion of its contents would be the result. Cases are related, if we are to believe them, where the experiment was very fairly tried, without exerting any influence on the uterus. Mauriceau says, that he bled one pregnant woman forty-eight, and another ninety times, for an inflammation of the chest, and that both went on to the full time.* Where, in any instance, the evacuation has been profuse and repeated, without any obvious reason, the conduct of the operator should be investigated.

Cathartics of a drastic nature, especially those which act chiefly on the rectum, and cause much tenesmus, if frequently repeated in females of moderate vigour even, with or without predisposition, may no doubt excite abortion; and occasionally, a similar result may succeed the reiterated use of those of a milder description. I have seen two women, who formerly had children, labouring under icterus in the seventh month, unattended by a single acute symptom, for which, each of them used a few doses of Submur. Hyd. and Pulv. Jalap C. combined, and in both the result was the premature expulsion of the fœtus; and I am disposed to believe, that this would not have happened had the vegetable cathartic alone been used. It is well known, that active aperients are freely exhibited during gestation, without, generally speaking, being productive of any unpleasant effect; thus Dr Rush states, that during the yellow fever of 1793, he administered calomel and jalap in large and frequently repeated doses, to females in every stage of pregnancy, and yet in no case were the medicines followed by abortion. When there is any suspicion that they have been administered with an improper view, the object for which they have been ordered, their nature, quantity, and how often they have been repeated, must be ascertained. By the frequent use of aperients, the uterus must imbibe a sympathetic influence from the intestines, whereby its fibres are excited.

Calomel, if given to such extent as to cause ptyalism in a woman at all predisposed to abortion, is sure to be followed by this accident: if the fœtus be strongly contaminated with syphilis, the same thing will happen whether mercury has

* Capuron Médecine Légale, p. 307. I have great difficulty in believing this; for although the French have bled sufficiently in the field, they are chary of phlebotomy.

been exhibited in sufficient quantity to affect the gums, or not. But unless there be a predisposition to premature uterine action, this drug may be exhibited to the extent of inducing violent salivation without occasioning any disturbance in the genital system. These remarks will explain the discrepancy which may be observed in the sentiments of professional men, regarding the effects of calomel on females in the gravid state; some contending that it will, and others that it will not cause the premature evacuation of the uterus. I remember being asked a few years ago, to visit a young girl, whom I found so violently salivated, with a view to excite abortion, that her tongue could be compared to nothing else than a honey-comb; but, notwithstanding her extreme suffering, she went on to the full time. Through the kindness of Mr Gibson of this city, I had an opportunity of witnessing the following case, in which the violent action of calomel produced abortion. The patient took two pills, each containing about 5 grs. of calomel; the purging and tenesmus which they caused, was so severe as to induce detachment of the placenta, and she lost about 4lbs. of blood before any one saw her; in four hours after this turning was effected, a dead fœtus extracted, and the patient herself died in less than two hours afterwards.

Emetics are dreaded by sensible females in a state of pregnancy, and justly; for although spontaneous vomiting has rarely been known by practitioners to be succeeded by premature evacuation of the uterine contents, yet the same action artificially excited is, by the general concurrence of accoucheurs, very apt to induce uterine action. Velpeau however, mentions one woman, who took 14 grs. of Tart. Antimon. severe vomiting ensued, but no abortion. When an idea exists, that the emetic was exhibited with a corrupt intention, we should ascertain whether it was given in a concealed form or not. The action of vomiting may destroy the ovum, either by the uterine fibres being excited and causing detachment of the placenta, or by the contraction of the abdominal muscles causing a rupture of the membranes of the ovum.

Diuretics have been said to possess the power of exciting abortion, but daily experience seems to prove the contrary, by this accident not supervening in cases of pregnancy complicated with dropsy, in many of which the fœtus has been retained to the full time, notwithstanding the vigorous use of several active agents of this class. Such medicines have no specific power, but what might be equally derived from the repeated use of strong cathartics. The continued exhibition of digitalis will, I think, poison the fœtus and lead to

abortion; but what is equally to be dreaded, it will also destroy the parent, as may be said to have happened in the following instance. A married female aged twenty-six, fair complexion, relaxed delicate habit, but not spare, the mother of several children, had ascites in her former confinement, and applied for the same complaint when in the eighth month of this her fourth pregnancy. In the course of twelve days she took six drachms of Tinc. Digital. On the twelfth day at two A.M., the fœtus, still-born, was thrown off before assistance could be afforded to her; and in twelve hours and a half afterwards, the woman herself expired, although she was in the most favourable state when left after her delivery. The child seemed to have been but a very short time dead, for it exhibited no evidences of putrefaction. This medicine semetimes accumulates in the system, and declares its effects suddenly, as in the foregoing case. The body was examined twenty-five hours after death; it was running rapidly into putrefaction. About three pounds of water were contained in the chest; in the pericardium were found a few ounces of sero-sanguineous fluid; in the abdomen, the effusion was very trifling.*

Cantharides has been taken in rather large doses, with a view to excite the uterus, but without effect. Mr Lucas mentions a case, where a woman swallowed about a drachm of this drug, and though it occasioned frequent vomiting, violent spurious pains, tenesmus and immoderate diuresis, with fever, which reduced her to extreme weakness, yet she went on to the full time.† Foderè mentions a woman, who swallowed half an ounce of powdered cantharides; in a short time she was seized with labour pains, and brought forth a living healthy child, amid excruciating torture, but died herself the next evening. A woman in this town swallowed a handful of saltpetre, and in half an hour abortion was induced, without injury to herself.

Of the class Emmenagogue, some articles may be mentioned as particularly calculated to induce abortion. The powder or an infusion of the leaves *Juniperus Sabina*, are drugs which

* The particulars of a case which happened some years ago in this city, were communicated to me, in which an eminent practitioner ordered in a common mixture some Tinc. Digit. for a middle aged female. She continued its use for some days, but suddenly experienced some unusual symptoms, and in a very few hours thereafter died. A gentleman who had been called in, in the hurry of the moment, declared that the patient had been poisoned with fox glove. The husband charged the ordinary medical attendant with this grave error; but to convince him that the medicine was not in fault, the prescriber offered to take the same quantity himself, an experiment, which, fortunately, was not insisted on by the complainer.

† Mem. Med. Soc. Lond. v. 2. p. 412.

have long been used as a secret remedy to produce abortion, and there is little doubt, when exhibited in large doses, it excites violent disturbance in the general system, and consequent abortion. There is reason to believe, that both its oil and substance have been given for this iniquitous purpose. In the case of Miss Burn, for whose murder Mr Angus was tried at Lancaster in 1808, it was supposed the oil of this medicine had been used. Some years ago I was called by Mr Blyth, now a medical officer attached to one of the divisions of Royal Marines, to assist him in the case of an unmarried woman, who was reputed to possess some secret by which she could excite abortion at pleasure. The fœtus was in the commencement of the sixth month, still born; and I was assured that she had produced several in the same way. It was currently reported that she used Savine powder; and I might probably have known more of her arts, had I not, in the feeling of the moment, forcibly pointed out to her the criminality of what had come to my knowledge; after which I heard no more of her. Of the strong poisonous quality of this drug, it is sufficient to state, that in the experiments which M. Orfila* performed with it on two dogs, six grains of it killed the one in sixteen, and four grains the other in thirteen hours. It does not always, however, produce abortion; for M. Foderè relates the case of a poor girl, half idiotic, cachectic, and seven months pregnant, who took from the hands of the person who was supposed to be the father of the child, a glass of wine containing some Savine powder. She became so much indisposed after it, that it was deemed expedient to send a report of the transaction to a magistrate, who ordered Foderè to visit her. She informed him that after having swallowed the drug, she felt a sensation of pungent heat in her bowels, accompanied with hiccough and vomiting, followed by a violent fever, which continued upwards of fifteen days. These symptoms were nevertheless relieved by refrigerants, the woman was kept under surveillance, and at the end of two months she was safely delivered of a healthy child.†

Of late years much has been said, regarding the power which the Secale Cornutum, ergot, or spurred rye, possesses of acting upon the uterus. Some writers assert that it has no influence whatever on this organ; others again say, that it has, but only when labour is present or impending. I cannot, however, agree with either; for from cases which have happened in my own practice, I maintain, that the

* Vol. ii. pp. 36, 37.

† Vol. iv. p. 434.

ergot will excite contractions of the uterus, though labour is not impending, and even though the organ be not pregnant, as I have in more than one instance, in the case of deformed pelves, induced labour by the administration of this drug; and in a case where a woman applied to me, to be relieved of a uterine polypus, the tumour being found, on examination, to be situated so high that it was impossible to reach it, ergot was administered, and after she had taken it four times a-day for two days, bearing-down efforts supervened, and the tumour was forced so low that it could be reached with facility. On these grounds, then, there is no reason to doubt that the ergot of rye will induce uterine contractions, without injury to the mother; in some instances, however, it appears to be inert. Its administration is not without danger to the life of the fœtus, but it is not yet agreed in what way the ergot exerts its deleterious influence upon it,—whether it acts as a poison, or whether it destroys the infant merely by the violence of the uterine contractions which it causes. I am inclined to adopt the latter view, because the life of the fœtus is destroyed almost solely in those cases where ergot has been administered after rupture of the membranes, and under the same circumstances I have observed fractures of the cranium; and also, that the children born where ergot was given, frequently died shortly after birth, of meningeal inflammation and hydrocephalus, probably caused by pressure.

Natural causes, or those in which no criminal intention can be ascribed to the party concerned, are numerous. All acute diseases, syphilis, the intemperate use of cordials, violent exercise of any kind, the elevating passions, particularly anger, accidental blows on the abdomen, the death of the fœtus, detachment of the placenta, excess in venery, irritation of neighbouring organs from constipation, dysentery, hæmorrhoids, diarrhœa, and catarrhus vesicæ, may all, in a habit predisposed, lead to abortion, without any participation on the part of the parent. By Dr Arrowsmith, who, in 1828, on the occasion of his graduation at the University here, wrote a highly creditable Essay on Infanticide, in which he has evinced a very accurate acquaintance with Midwifery, it is stated that when the fœtus is lost from detachment of the placenta, it is owing to hæmorrhage. Many opportunities have enabled me to remark, that a detachment of from a third to a fourth of the mass, will shortly afterwards be followed by the death of the child; but when the placenta is adherent at any point above the cervix uteri, the bleeding is so trifling, that the death of the fœtus cannot be

ascribed to it; and, moreover, none of the effusion comes from the fœtal vessels: the loss is altogether maternal. The destruction of the infant, therefore, must arise from the destruction of a function requiring integrity of placental attachment.

In conducting these investigations, it is necessary to examine the extruded mass, to ascertain whether it consist of hydatids, a mole, or a fœtus; and if the latter, its age: all these points are fully described under their proper heads.

It is desirable to learn by what means the expulsion has been accomplished, whether with the consent of the female, or by exhibiting drugs in a concealed form; or whether she has herself been using medicines, and of what nature. When the child is expelled, any wounds, though mere cuticular abrasions, should be carefully noticed. The head must be minutely examined, to determine the presence of pin or needle punctures.

From the foregoing observations, it is obvious, in the *first* place, That all our pharmaceutical agents, reputed for exciting abortion, are uncertain in accomplishing this unwarrantable act; and, *secondly*, That the attempt is very liable to involve the life of the mother; who, indeed, may be the only victim, while the real object of persecution escapes uninjured. M. Foderè* mentions the case of a cook, who, finding herself pregnant, and being anxious to conceal her situation, swallowed half an ounce of powdered cantharides, with an ounce of the sulphate of magnesia. Some hours afterwards she was seized with severe pains resembling colic, and she produced a living child in the sixth month; but in the course of the same night, she expired in great agony. These latter points I wish to be urgently impressed on the mind of the medical attendant, lest he may at any time, by powerful incentive, suffer himself to be betrayed into an act so contrary to every moral obligation, and so liable to be succeeded by fatal consequences. For, I conceive the accessaries and accomplices in this unprincipled experiment, to be as amenable for whatever may befal the parent, as for the destruction of the fœtus. And it has been very properly observed by Dr Percival, with equal truth and beauty of expression, that to extinguish the first spark of life is a crime of the same nature, both against our Maker and society, as to destroy an infant, a child, or a man: these regular and successive stages of existence, being the ordinances of God, and subject alone to the divine will.

* Vol. iv. p. 436.

Sect. V.—*Murder of the Child after Birth, with an account of the various Proofs and Modes.*

The first circumstances which create suspicion in cases of infanticide, are a sudden diminution in the size of the abdomen in an individual suspected of pregnancy; the disappearance of an infant; or the body of one being found exposed, or concealed, with or without marks of violence. Much may also be gleaned from the manner in which the suspected individual endeavours to explain the decrease of the abdominal tumour, or what has become of her child when she is known to have possessed one; more especially, where her answers are confused and equivocal. Where there is any foundation for our suspicions, we are in the next place to determine, by the signs already given: *first*, Whether the accused has actually been pregnant; *secondly*, Whether she has given birth to a child; *thirdly*, Whether from her condition we are justified in considering her the mother of the dead fœtus, *i. e.* whether the age of the fœtus appears to correspond with the probable date of delivery, as deduced from its signs; and, *fourthly*, To determine whether there was any premeditated intention to destroy the infant, we should ascertain if any clothing had been provided for it. Having proved the female to be the parent of the dead child, the following very important questions come next to be decided; *first*, was the fœtus born alive; and, *secondly*, if born alive, by what means has it been destroyed.

For a solution of these two questions, we must refer to certain conditions of the circulating and respiratory organs alone; for whatever influence the nervous system exerts, none of it can be traced.

We may conclude the child to have breathed, if blood in considerable quantity be found in the pulmonary arteries; for, previous to the commencement of this function, these vessels are empty and collapsed, and receive little if any of this fluid, which, after respiration, flows into them freely, for the purpose of being arterialized. After birth, some important changes take place in the vascular system, which must be attended to in medico-legal investigations. The ductus venosus, and arteriosus, from the moment breathing begins, become gradually more contracted, and are ultimately converted into ligaments. These channels I have found impervious in children a year old. The foramen ovale gradually closes after birth, but the exact period at which this change is completed varies; for it has been found open at an advanced period of life; and in children more than a year old I

have often succeeded in passing a probe from one auricle into the other. Some years ago, Prof. Bernt of Vienna brought forward a series of observations, on changes in the ductus arteriosus, attempting to prove, that it could by them be determined, whether or not the child had been born alive; according to him, if the child has respired only for a few moments, this canal loses its cylindrical form, and becomes somewhat of the shape of a truncated cone, with the apex towards the aorta, and the base towards the heart; but after the lapse of several hours, or a day, the duct again resumes its cylindrical form, but is then much diminished in size; it was at first equal in size to the pulmonary artery, but is now not longer than one of its branches. This test of vitality was so strongly advocated by Prof. Bernt, as to receive the name of the "Vienna test;" but unfortunately it has not answered the expectations formed of it on its first announcement, for it has been found that the changes described, do not always take place with the regularity and rapidity which Bernt had alleged, and even in his own cases, frequent irregularities were met with. Bernt also attempted to show, that certain changes take place in the position of the interauricular opening, if respiration had continued only for a few minutes. These successive changes would, according to these authors, suffice not only to show whether the child had breathed at all, but how long it had survived its birth. According to Bernt the foramen, which in the fœtus is situated in the centre of the fossa ovalis, is found at the right side immediately after respiration is established—it then proceeds upwards, revolving, as it were, round the right edge of the valve, so that in a few days it will be found at the upper side. These changes, however, do not appear to be invariable, for even in Bernt's cases, there are numerous exceptions.

Ecchymoses, or extravasations from blows or other injuries, on any part of the body, prove that the child enjoyed vitality when they were inflicted; especially if there are any signs of inflammation having supervened, for the blood could not be conveyed to the injured part after the action of the heart had ceased. Marks closely simulating ecchymoses, may certainly be caused by blows inflicted after death, but they want the true characters of ecchymoses. Extravasation, however, is occasionally the result of putrefaction, but the general condition of the soft parts will point out the distinction, together with vesication of the cuticle.

The external and internal conditions of the thorax vary considerably, according as the fœtus may have breathed or

not. Where this function has not been established, the chest will appear flat and compressed, the lungs dense, of a reddish brown colour, collapsed, remarkably small, and hence leaving the heart and pericardium uncovered. The pulmonary vessels, as already stated, are almost empty. When such lungs are placed in a vessel of water, they immediately fall to the bottom; and as compared to the weight of the whole body, the ratio will be found, according to Devergie, to be as one is to sixty. After the child has breathed, all these characters are reversed. Externally, the thorax is more arched and expanded in every direction. The lungs are more voluminous, occupy more of the cavity in which they are contained, and cover a larger portion of the pericardium than formerly: their colour is less deep, their vessels are more distended with blood, they feel more elastic; and when cut into, they crepitate in consequence of the extrication of air from their cells. Their specific, as well as absolute weight, is now changed; and accordingly, when put into a vessel of water, they float upon its surface; and when compared to the whole weight of the body, they will be found as one to thirty-eight; or in other words, the absolute weight of these organs in an infant that has breathed, will about double that of one that has not. The diaphragm is less arched after, than before the lungs begin to act, being pressed downwards by the increased volume of these organs.

By the examination of the organs of respiration, we determine whether the fœtus has been dead or alive at birth. If the lungs of an infant which has not breathed, be placed in a vessel of water, they will generally sink, because they are specifically heavier than the surrounding medium; but if the child has once respired, they commonly float,* since they are specifically lighter than the fluid in which they are placed. This is what has been styled the hydrostatic test. When these organs float, the conclusion therefore must be, that the fœtus breathed, and was alive at birth; and on the contrary, if they sink, that it had not respired, and was dead when born.

To the foregoing test it may be objected, that the lungs, if they have suffered in a slight degree from emphysema or putrefaction, will swim, though the fœtus may have been dead-born. It becomes necessary to point out the distinction betwixt lungs floating in consequence of natural respiration, and such as float from these causes. It is proper, in

* If a child makes but one gasp, and instantly dies, the lungs will swim in water as readily as if it had breathed longer, and had then been strangled. Dr William Hunter, Med. Observ. and Inquir. Lond. vol. vi. p. 287.

the first place, to state, that when the child is still-born, the lungs when perfectly sound, will at first invariably sink, unless affected with emphysema; this condition may be easily recognised by a knowledge of morbid anatomy, the air is stated to be found only in the fibrous tissue, connecting the pulmonary lobules, and contained in large vesicles or bladders; moreover the emphysematous parts of the lungs are whitish, have a doughy feel, and the large vesicles are chiefly situated on their edges, so that in lungs floating from emphysema, if a piece be cut out of their centre, it will be almost certain to sink.

A numerous train of experiments were carefully conducted by Mayer, with regard to the floating of the lungs from putrefaction. He found that after an interval of two or three days, the water in which the lungs were left became turbid, the organs themselves assumed a different colour and increased in size, air bubbles were scattered on the surface of the water, and a putrid odour became perceptible. All these appearances continued to increase until the sixth, or the eighth day at the latest, when the lungs, both entire and divided portions, rose to the surface, and a putrid odour became perceptible. On removing the putrid masses into vessels containing clean water, they still continued to float, but the slightest compression caused them to sink. When the water in which the organs are placed is exposed to the sun, they float on the sixth; but not until the tenth or eleventh day, if the water which contains them be exposed to a free current of air. They continue on the surface, becoming larger, and exhaling an intolerable odour, until the twenty-first, or, at the latest, the thirty-fifth day, when, without an exception, they fall to the bottom. These experiments are supported, *first*, by the fact of lungs, when removed in a putrid state from the chest, floating when placed in water; and *secondly*, by the circumstance of a drowned body at first sinking, rising to the surface after a certain degree of putrefaction has taken place, and, when this process is far advanced, sinking again to rise no more. The foregoing experiments clearly prove, that, in the incipient stage of putrefaction, lungs which have never performed their functions will float in water; and when the putrefactive process has advanced so far as completely to destroy organization, and all the air is disengaged, that they will sink in water.

Besides the changes induced in the colour, volume, and structure of these organs, by putrefaction, there are other marks by which they may be distinguished from lungs which have respired; in the *first* place, when they float in conse-

quence of decomposition, air bubbles will be seen under their external covering, where respired air never finds access. *Secondly*, decomposed organs may be distinguished by the facility with which they can be deprived of their contained air; which may be accomplished by squeezing them in the hand; whereas no compression, however strong, can force air from the substance of lungs which have received it in the exercise of their natural functions. *Thirdly*, If a portion be cut out of the centre of a decomposed lung, it will probably sink, owing to the air generated by decomposition being confined to the surface; while, on the contrary, if the organs float in consequence of respiration, a piece from their centre will more certainly float than a slice from their surface. From numerous experiments which have been performed by medico-legal inquirers of distinction, it would seem, that, with the exception of the bones, the lungs are the last parts that become putrid. *Fourthly*, When the organs are in a state of putrefaction, Marc thinks that it may even then be determined, whether they have respired or not; that in the former case, they have always a crepitus when cut into; while those which have never respired, though they float in water, are destitute of it. When, after squeezing from sections of the lungs the matter generated by putrefaction, they sink in water, he thinks it a more decisive test that the child was still born; but when, notwithstanding this, they still continue to float, that they are from an infant which was born alive.

A *second* objection which has been urged against the hydrostatic test is, that if the lungs have been artificially inflated they will float in water, though the fœtus may have been still-born. It was for a long time contended by the most respectable authorities, as Heister, Hebenstreit, Roederer, and Brendel, that the lungs of a dead-born child could not be inflated; the contrary, however, has been proved, and is now very generally maintained by some of the most celebrated medico-legal writers, though it is allowed that their inflation cannot be effected with that ease which was at one time supposed. As it is possible then to inflate lungs which have never respired, and as this may have been done by an anxious parent to attempt resuscitation, if not by some malicious person with a view to bring a false accusation against the mother, it is necessary to determine whether the organs float in consequence of artificial or natural respiration. If the infant has been born dead, the arteries and veins of the lungs will be found in a state of collapse, and destitute of blood. When, on the other hand, these vessels are found in

a state of distension, we may be assured that the child has been born alive; for nothing but natural respiration can have this effect. This question may also be determined by remembering what has already been stated regarding the comparative weight of the lungs with the body. In the fœtus that has not breathed, the weight of the lungs is one sixtieth that of the whole body; but after respiration, in consequence of the volume of blood which enters their substance, their weight amounts to one thirty-eighth of the body. This test, which was first announced by M. Ploucquet, has been found, by an extensive series of experiments performed by M. Chaussier of Paris, and M. Schmidt of Vienna, not to merit that confidence to which it was at first thought to be entitled. Another mode of ascertaining whether the fœtus has been born dead or alive, has been recommended by the late M. Beclard. He maintained that the lungs of a child which had not respired, but which floated in consequence of artificial inflation, might be deprived of all the air contained in them, preserve their original density, and sink in water: that in a fœtus which had respired, on the contrary, it was impossible by any pressure to force out the air so completely as to cause the organs to sink in water.

A *third* objection to the hydrostatic test is, that a child will very commonly breathe as soon as its mouth is excluded from the vagina; and in that case may lose its life before it is born, especially when there happens to be a considerable interval of time between the expulsion of the head, and that of the body, as by law, a child is not considered as born alive, until it is wholly expelled, and possesses an independent circulation. It has been doubted whether the fœtus ever breathed while in this situation, but that it does is perfectly certain, and may be frequently observed by gentlemen in extensive practice.* It is denied that life becomes extinct under the circumstances stated; and Dr Beck, in asking whether such a thing is probable, replies in the negative. That the fœtus is lost while in this position, is no less certain than that it breathes in it, though the one is by no means so frequent as the other. I have seen two such cases: in the one

* We are assured by Roederer, Mechel, and Osiander, that the fœtus may breathe even while in utero; and Bohn and others assert that they have heard it cry in this situation. In Siebold's Journal, a case is related by Bredenoll, in which a woman had twins. The first was extracted by forceps; and the second, after rupturing the membranes, was brought away by the feet; during which manœuvre the operator heard the fœtus distinctly cry, at least a dozen of times. After the rupture of the membranes, and escape of the liquor amnii, the breathing of the fœtus in utero may be understood; but previous to this it is altogether irreconcileable.

it was the woman's first child, and was attended by Mr Nicolas M'Candie, one of my pupils, now a practitioner in Tain, whom I accompanied, from the labour having been tedious. When the head was born, we both distinctly heard the infant cry. About five or seven minutes might have elapsed before the shoulders were disengaged; and although the infant appeared stout, yet it was still born, and could not be resuscitated. The second case happened several years afterwards. This woman was the mother of several children, and was attended by Dr John Clarke, now a medical officer in the army. The infant was large, had several loops of the funis entwined around its neck; and I was present before the head was born, when it began to breathe. In consequence of the size of the shoulders, at least seven minutes elapsed before they could be disengaged, and the child was lost.

The last objections of any moment, brought against the hydrostatic test, which I shall notice, are, *first*, That though the child may have been born alive, yet the lungs, if affected with inflammation, will sink,*—this has also been observed where the lungs were tuberculated or affected with scirrhus; and, *secondly*, That they will do the same if they have not been freely inflated, from the child being feeble. In regard to the first of these objections, it may be supposed, that though a part of these organs may be impermeable, yet the air will pass freely into the healthy portions. Such lungs, therefore, may be distinguished from those of an infant which has not respired, by slicing them, and placing the whole in water, when the diseased portions will sink, and the healthy remain on the surface. The same simple experiment will also distinguish organs which have been but imperfectly inflated, from those which have not respired at all; as the portions which have received no air will sink, while parts that have, will float.

The various causes by which a child may be destroyed, have been placed under the following heads; viz., *Omission*, and *Commission*. To *the former* are referred all cases in which infants seem to have been lost from some neglect on the part of those intrusted to their management; and to *the latter*, all examples in which children have been designedly destroyed.

First, To omission may be referred, cases where the infant

* Inflammation of the lungs in the new-born fœtus, is not of rare occurrence, for several cases of this nature have happened in my own practice. That the organs when thus affected will sink, is well supported by the fact of their doing so in similar circumstances in adults, as numerous trials have confirmed.

is lost when a woman is delivered without assistance, and when it is suffered to remain with its mouth applied against the bed-clothes, whereby respiration is prevented without any criminal intention. Cases of this nature are related by several authors.*

Deficiency of clothing during intensely cold weather, may destroy an infant; and such conduct practised towards an illegitimate child, should always be viewed in a suspicious light. Foderé states, that if the body of an infant be found stiff, discoloured, shrivelled, and naked, or with only a slight covering on it in a cold place, buried under stones, or under the earth, and from experiments performed on the lungs, it is evident respiration had been established; and if the great internal vessels are found gorged with blood, accompanied with an effusion of the same fluid into the cavities, while the cutaneous vessels are contracted and almost empty, and when no other cause of death can be detected, one cannot do less than attribute it to the cold, and consider this abandonment as a manifest intention to make away with the infant.†

Omitting to give proper nourishment may be a cause of death. For the first two days, a vigorous child will suffer little, though he receive scarcely any support; but longer deprivation may be attended with injurious consequences; and delicate infants often fall victims to an improper, as well as an insufficient secretion of milk. I have detected a cause of child murder which is not mentioned in books; viz., giving infants at birth to be nursed by a woman whose milk is twelve or fourteen months old. Illegitimate children are frequently thus disposed of at birth, the party concerned being well aware that they cannot long subsist on such nourishment. Several examples of this nature have come under my notice, one of which I made the grounds of a complaint to a public functionary, but it was disregarded. It is a very common practice, in the case of deformed children, especially those with hare-lip, and cleft palate, to allege that they cannot suck, and thus starve them, although nothing could be easier than to feed them with a spoon, and more than one instance has come to my knowledge, where deformed children have thus been starved to death.

* "I found it lying on its face, in a pool which was made by the discharges, and so completely dead, that all my endeavours to rouse it to life proved vain." Dr William Hunter, Med. Observ. Inquir. Lond. vol. vi. p. 289. Beck relates a similar case, p. 177.

† Foderè, vol. iv. p. 505.

Omitting to secure the funis may cause the death of the fœtus by hæmorrhage, though the contrary was at one time maintained. I have known three infants destroyed, two by the accidental, and the third by the intentional, removal of the ligature from the funis.

Under the head of Commission, the *first cause* to be noticed is, *premature tying of the funis.* I was once called to a case of this kind several years ago, and was informed that to the application of the ligature immediately succeeded great breathlessness, and livor of the countenance, which was relieved by the application of two leeches to the region of the heart. A few months ago, I was present at the inspection of the body of a child which had died very shortly after birth, apparently from this cause: the appearances presented on dissection were almost precisely similar to those which I have observed in persons who have died by hanging; all the organs were gorged with blood, and on the surface of the liver was an ecchymosis, an inch long, and about a quarter of an inch in breadth, and projecting about the sixth of an inch, the peritoneum being raised, and blood extravasated between the liver and this serous envelope; there was also a small quantity of serum in each pleura. All that could be learned of the history of the case was, that the infant had been born before the arrival of a medical man, and the nurse immediately put a ligature on the cord; the child was observed to breathe with difficulty, and to sob rather than cry, though very stout, healthy, and born at the full time, and the parties were too respectable to entertain the slightest suspicion of foul play. When injury arises from this cause, it should rather be ascribed to ignorance than evil design, except where a properly qualified practitioner is concerned.

Long compression of the head during labour, is sometimes followed in a day or two thereafter, by fatal convulsions. Such is the degree of pressure to which the head is occasionally exposed, either during a primary labour, or during its transit through a narrow pelvis, that after death I have in some instances discovered extensive ecchymosis between the integuments and the bones of the cranium, or these bones themselves fractured. To determine the effects of pressure or blows on the fœtal head, the following very interesting experiments were performed by Lecieux. *First*, fifteen infants who had died after birth, but whose cranial bones were sound, were raised by the feet eighteen inches, and suffered to fall perpendicularly upon a hard floor; and by anatomical examination, it was found that in twelve of them, there was

a longitudinal or angular fracture of one of the parietal bones, and sometimes of both.

In a *second series* of experiments, the same number of infants were allowed to fall from a height of three feet, in twelve of which, there was found on dissection, a fracture of the parietal bones, which in some extended to the os frontis. When suffered to fall from a greater height, other injuries, such as ecchymosis, rupture of vessels, &c., were produced.

In a *third* and *fourth series* of experiments, where fœtal crania had been subjected to the firm pressure of the thumbs, and blows from a stick, the results were the same.* These experiments are, however, open to an important objection, if we suppose a child to be suddenly expelled from a woman in the erect position, its fall will inevitably be broken by the breaking or tearing of the cord, and by the woman's clothes; this is borne out by a return which was made from the hospital of Stuttgardt, where, of 183 cases of sudden expulsion, in 155 the mother was in the erect position, in 22 sitting, and in 6 on her knees, and in none of those instances except one did the infant meet with any injury, and then merely a trifling ecchymosis: in one instance I saw a fœtus, the head only being born, fall from the vagina, a height of thirty-three inches, without injury, the fall being broken by the tearing of the cord. When the infant is cut off suddenly by convulsions soon after birth, in a case where the labour has neither been difficult nor protracted, the cranium, as well as every circumstance connected with such a case, should be made the subject of careful scrutiny.

Thrusting a sharp instrument through the fontanelles, into the brain, is one of the most common methods of depriving an infant of life. Gui-Patin speaks of a midwife who was executed at Paris, for having destroyed several children in this manner. Brendel and Belloc have met with similar cases. In such examples the head should be shaved, when, probably, slight ecchymosis will be found around the puncture; in which case, the brain ought to be examined to ascertain the depth of the wound. Needles or other sharp instruments, are sometimes thrust through other parts of the infant, as the temples, the neck, region of the heart, or some point of the abdomen; so that every part of the body should be carefully inspected.

Interrupting the respiration, is a cause by which the child may be destroyed; as by drowning, hanging, strangulation, smothering under bed-clothes, and suffocation by thrusting

* Dict. des Sci. Méd. vol. xxiv. p. 418.

foreign bodies into the mouth and nostrils. Foderè relates a case in which the parent, a widow, not only concealed her pregnancy, but her labour, even though surrounded by several females at the time; and succeeded in destroying the fœtus the moment after its expulsion, by crushing its head betwixt her thighs.* The neck should be examined, and if a cord has been used, a purple mark or ecchymosis may be perceived around it; the vessels of the eyes injected, and the organs themselves protruding from the orbits; the face livid, the tongue projecting, the mouth frothy; the vessels of the pia-mater and jugular veins gorged with blood; and the lungs livid, covered with spots. In persons whose lives have been destroyed by drowning, besides the frothy condition of the tongue and mouth, the nostrils are found in the same state; the eyes half open, and the pupils dilated; countenance and whole surface remarkably pale, but occasionally the head is bloated, and the face red. With these, we discover on dissection, congestion of the cerebral vessels, and of those of the right side of the heart, while on the left side they are empty; watery or sanguineous froth occasionally in the trachea or bronchi; the diaphragm depressed in the abdomen; the blood in a permanently liquid state, oozing from the body on the least touch of a scalpel; and water occasionally found in the stomach. When life is first destroyed, and the body afterwards submersed, some traces of injuries as ecchymosis, wounds, or evidences of poisoning may be discovered; the external characters described in persons destroyed by submersion, as well as water in the air-passages and in the stomach, will be absent; the lungs will be collapsed, and not gorged with blood, the blood coagulated; and the diaphragm in a state of natural tension. Dr Beck and Professor Burns mention that the infant may be accidentally strangled, while in utero, by the funis being entwined round its neck, and that all the foregoing symptoms may result from such a cause. A more absurd declaration could not have been made by people totally ignorant of the subject. It would require a very ingenious mind to explain how a child in utero, or until after it has breathed, could be destroyed by any cause of this nature. Equally ridiculous is it, since respiration has not commenced, to say that the fœtus may be destroyed by the os uteri contracting on the neck, in a presentation of the feet. It is thought that the infant may sometimes be destroyed by knots being

* Il resta constant qu'elle avoit ecrasé la tête de son enfant, en la comprimant fortement avec les cuisses lors de sa sortie, vol. iv. p. 525.

formed on the funis. And Smellie* relates an example where we might certainly be induced to think that this had happened; but I have both seen and heard of several instances where knots were found on the funis, without exerting any injurious influence. In these last cases, no accusation can be preferred against the parent, since while the fœtus and placenta *are attached, and the latter in the passages*, it would be impossible to form a knot on the funis.

When an infant has been smothered under the bedclothes, the same phenomena will be observed as after strangulation, and the lungs will float. In suffocation induced by articles forced into the mouth, nostrils, or throat, dissection can alone elicit the cause. It is said that respiration may be interrupted by the tongue turning backwards on the epiglottis. This can happen only where there is some natural defect in the frænum linguæ, or where it has been torn. The frænum cannot be divided simply by sucking, and where this is discovered, we may always suspect artificial interference.

Children have been destroyed by being shut up in a close box, and thus deprived of oxygen, and a curious case is recorded, where some drunk men amused themselves by repeatedly blowing out a candle, and holding the child's nose over the smoking wick, which proved fatal to the infant.

Luxation and fracture of the neck may be mentioned among the causes. In such cases, the vertebræ are fractured, the ligaments are ruptured, and life is destroyed by the injury inflicted on the spinal cord. Such a state may be ascertained by the local derangements, and the position of the head; and, on dissection, by blood being found effused among the cervical muscles, or into the vertebral canal. Infants may be destroyed by exposing them to noxious vapours, as those of sulphur; or by mixing poison in their food, applying it to the surface, or giving it to them in the form of enemata. It may be impossible in such cases to detect the poisonous agent, unless we are led to it by its odour, or the symptoms which it may have induced; if suspected it may of course be ascertained by subjecting the contents of the stomach and bowels to the test of chemical analysis.

Finally, it should be remembered, that the child may be destroyed without any criminal intention on the part of the mother, by the labour coming on unexpectedly, and her being unable to assist herself or procure any one else to do so.

* The labour was lingering, and the fœtus when expelled was of a livid hue; the scarf skin was easily stripped off, the abdomen tumefied, and the funis swelled and livid, with a knot tight drawn on the middle of it. Vol. ii. p. 335.

Females have been delivered in their sleep, and of course unknown to them; in which cases the infant might be smothered under the blankets. The fœtus has, in some instances, been unexpectedly thrown on the floor and much injured, while the parent was engaged in her ordinary occupation. Mr Tatham* relates a case where a patient, in her fourth pregnancy, after three trifling pains, was passing along the lobby to her bed-room, when the infant was suddenly thrown on the floor, bleeding profusely at the umbilicus, but ultimately recovered. It is possible for an infant to be destroyed by being unexpectedly precipitated into the water-closet. Mr Tatham also relates a case where the lady of a clergyman, in the last month of her first pregnancy, while the family were at chapel, was obliged to go to the night-chair; a great discharge of water took place, followed by twin children, which dropped into the utensil; from which, however, they were speedily rescued, but died within a week. The child may die shortly after birth, from having been born prematurely.

Previous to the examination of the lungs, the weight of the child, and general appearance of the body, should be determined, with a view to ascertain the following points, viz. whether the child have come to maturity; whether the shoulders be unusually large; if there be any tumours, marks of violence, or evidences of putrefaction on any part of the body. *Secondly*, the chest should be carefully opened, and the following particulars noticed; the general shape of the thorax, whether it be much arched or otherwise; if the lungs be collapsed or dilated, whether they cover the lateral parts of the pericardium and heart, if their colour be deep red or lighter, and if there be any symptoms of disease or putrefaction. *Thirdly*, the contents of the chest must be removed to perform the necessary experiments on the lungs. The aorta and vena cava should first be secured near the heart, and then cut beyond the ligatures; the trachea should then also be divided. The lungs, together with the heart, are now to be taken out of the chest, and to be submitted to an additional inspection, to ascertain whether they are sound or diseased, or if they are affected with putrefaction. *Fourthly*, a convenient vessel containing water must be provided, and particular attention paid to the temperature of the liquid in which the lungs are to be placed; for, if the water be too warm, it will have the effect of expanding the lungs and causing them to float, especially where there is a

* Med. Reposit. April 1827.

tendency to decomposition. If, on the contrary, the temperature of the fluid be too low, the air-cells may be contracted, much of the air expelled, and the lungs sink. The water should be as free from saline particles as possible, as in consequence of the greater specific gravity of that containing saline matters, a body might float in it which would sink in fresh water. *Fifthly*, the lungs, together with the heart, should then be cautiously placed in water, and it should be observed whether they float or sink; if the former, whether above the surface of the fluid, or just under it; if the latter, whether they do so rapidly or gradually. *Sixthly*, the lungs should then be taken out of the water, and after tying the pulmonary vessels, they should be separated from the heart and accurately weighed. *Seventhly*, the lungs should then be replaced in the liquid, to see whether they sink or float, and in what way. *Eighthly*, the two lobes should then be separated, and the same experiment repeated upon each, noticing the difference, if any, between them; if one only floats, and whether the right or left. *Ninthly*, each lobe should be divided into a number of pieces, taking care not to confound the fragments of one lobe with those of the other; and upon each of these the same experiments should be tried. *Tenthly*, while cutting the lungs, we must notice if there be any crepitus; if the vessels are charged with blood; and if there be any traces of disease. *Lastly*, if any of the sections of the lungs float, they should be taken and squeezed forcibly in the hand, and then replaced in the water, to ascertain whether after this they will sink. Various other modes of ascertaining whether the child has respired or not, have been proposed by different authors, but as they are found to be of little value, I shall only enumerate them; thus it has been recommended to find the relative weight of the heart and lungs; of the liver and lungs; also the average bulk of lungs that have not respired, and the increase in volume of those which have, and by this means to fix a standard, by which we may know whether or not respiration had commenced.

After these different processes have been carefully conducted, if there be nothing on the body of the infant to justify the supposition that it might have lost its life during labour; if there be no evidence of putrefaction in the lungs, or that they have not been artificially inflated; if, on cutting into them, a crepitus be perceptible; if the entire lungs, as well as the separate divisions of them, remain on the surface of the water; if, after squeezing portions of them, they still continue to float, then the mass of evidence is irresistible

that the infant was born alive, and enjoyed perfect respiration. If only the right lung,* or its pieces, float, the respiration has been less perfect. If some pieces only float, while the greater number sink, it proves respiration to have been still less complete. On the other hand, if neither the entire lungs, nor any section of them, float in water, the inference is decisive that the child never respired.

It is scarcely necessary to state, that the dissection should be conducted not only with great care, but by a person accustomed to such pursuits, to avoid mistakes which might mar the course of justice. Except where an injury is discovered on any particular region, the examination had better commence with that of the spinal column, as it will be more manageable before than after the large cavities have been opened. After the cautious removal of the soft parts from the vertebræ, their dorsal portions can easily be cut away, and the medulla exposed by a pair of scissors, since they are almost entirely cartilaginous. Our duty in this part of the investigation, is to detect displacement of the vertebræ, or effusion into the sheath of the cord; at the same time, the operator must be careful not to confound the flow resulting from the use of his knife, with any previous extravasation. That the examination may be conducted with strict accuracy, there should be several practitioners present, who are to certify and note every phenomenon as it exhibits itself. The mouth, passages leading therefrom, chest, and abdomen, in succession, should next be examined; and, lastly, the head. To obtain an ample view of the mouth and throat, the integuments covering the maxilla inferior, and the bone itself, should be divided in the centre, and the incision extended along the fore part of the neck to the sternum; after which the integuments are to be reflected towards each side. In exposing these parts, our object is to ascertain the presence of foreign bodies in the air-passage, the position of the tongue, and whether there be abrasion of the inner lining of the mouth. In laying open the trachea and œsophagus, if the latter contain a fluid, this, as well as the appearance of both these canals, should be particularly noticed.

The thorax and abdomen may be laid open at once, by an incision extending from the former one, along the centre of the sternum to the umbilicus, where it should branch off on each side towards the corresponding ilium. These incisions should be conducted with great care, lest any subjacent vis-

* According to the experiments of M. Portal, the right lung is more easily inflated than the left, from the right bronchial tube being both wider and shorter than the left. Med. Comment. Ed. vol. xi. p. 410.

cus be wounded, before a proper view of the whole has been obtained. The general appearance of the whole must be noted before an organ is touched; and the important duties of the operator, on exposing the contents of the chest, will be remembered from what has already been stated. In examining the abdominal viscera, the size of the liver, and the condition of the urinary bladder, are to be attended to. It is certain, that in a child which has breathed, the former organ rapidly diminishes in volume after birth; and, if the latter viscus be found empty, it is a sign that the infant has lived for some time after birth. The whole of the alimentary tube should be removed into a convenient vessel, but a ligature should previously be placed on the upper part of the œsophagus, on the hepatic and pancreatic ducts, and on the lower part of the rectum. If perforations be found in the stomach or intestines, any fluid effused into the abdominal cavity should be collected. The contents of the bowels or of the abdomen should be subjected to the test of chemical agents. In this investigation, it is proper to mark whether the meconium have escaped or not: it has been said, that this does not happen except when the child is dead or premature. Such assertions can be made only by practitioners of limited experience in midwifery, for the escape of the meconium is a very common occurrence, in cases where, during parturition, the fœtus is exposed to much pressure; and I have known it happen independently of any circumstance of this kind.

In the examination of the head, if there be no evidence of puncture, we must ascertain whether there be fracture of any of the bones, ecchymosis between them and the integuments, or if the bones overlap much; for any one of these conditions may account for its death. The substance of the brain is to be carefully removed, to ascertain whether it contain any kind of extravasation or tumour.

In England, in 1803, it was enacted by Lord Ellenborough, that persons administering medicines wilfully, or using any instrument to procure abortion, previous to quickening, as well as their counsellors, aiders, and abettors, shall be declared guilty of felony, and shall be liable to be fined, imprisoned, put on the pillory, privately or publicly whipped, or transported beyond seas for fourteen years. The same act ordains, that administering medicines, &c., with intent to procure abortion after quickening, shall be punishable with death. Of the whole, the law of Scotland on this head, is the most ridiculous; for the learned commentator observes, that all procuring of abortion or destruction of future birth, whether quick or not, is excluded from the idea

of murder; because, though it be quick, still it is only *pars viscerum matris*, and not a separate being; or in plain language, if an individual cuts his own throat, we are not to interfere, since he has a right to dispose of himself as he pleases. I have already elsewhere expressed my opinion, how the ends of justice could be best satisfied in cases of this kind. Child-murder, in almost all civilized countries, is considered a capital crime.

Foundling hospitals have been established in different countries to receive illegitimate children, with a view to the diminution or prevention of the crime of child-murder, but it may be doubted how far they have answered these highly commendable intentions. It is very certain that they tend to the demoralization of the community, while facts would seem to prove that they have not remedied the evil, but merely rendered it less conspicuous in the eyes of the public. The existence of these establishments, by concealing the frailties of the sex, and sheltering them from that ignominy and censure inseparable from their situation, has, in a great degree, removed the most powerful check on illicit intercourse. That foundling hospitals have not conferred that benefit on humanity which it was expected would flow from them, their own records sufficiently prove. In Paris, in 1790, more than 23,000, and in 1800, about 62,000 children were received; and it is estimated, that eleven-thirteenths of all the foundlings perish annually, through hunger and neglect. It is mentioned also, that great numbers of them die from a disease which is styled *endurcissement du tissue cellulaire*, called in this country, skin-bound disease, and of rare occurrence in private practice. Sir John Blaquiere stated to the House of Commons of Ireland, that of 19,420 infants admitted into the foundling hospital of Dublin, during the last ten years, 17,440 were dead or unaccounted for. In Moscow, with every possible advantage, of 37,607 admitted in the course of twenty years, only 1,028 were sent out. In London, the results have been more favourable; the number of deaths under twelve months have been fewer than 1 in 6.

PART SECOND.

PARTURITION.

CHAPTER I.

CLASSIFICATION OF LABOURS.

Inseparable from parturition or labour, which merely means the emancipation of the fœtus and its involucra, are the *modus operandi* of, and the changes experienced by, the maternal organs during this complex function. From an early period, an attempt has been made to arrange labours under distinct heads, according to the management required in any given case. Hippocrates adopted a very simple arrangement, with which some teachers of the present day are satisfied; he referred all cases to two classes; viz. natural and laborious. In the former he placed all labours in which the head presented; and in the latter, presentations of other parts of the fœtus. But as it was observed that in some instances the process was easily conducted, though the head did not present, Smellie added a third class, styled præternatural, including all births where the body preceded the head; and which may be considered the first approach to a nosological arrangement. The distinguished Baudelocque, with that desire for novelty so characteristic of his countrymen, invented a fourth class, which he called instrumental,—an arrangement which does not essentially differ from that adopted by Smellie. Dr Burns has unnecessarily multiplied the number of classes to seven; viz. natural, premature, præternatural, tedious, laborious, impracticable, and complicated. A labour is termed premature when the fœtus is expelled earlier than the natural term, but at such a period as to afford a prospect of its being reared. To a practitioner who knows that when uterine action supervenes prematurely, the fœtus may present the head or feet, or that the labour may be natural or preternatural, and that such cases must be managed precisely the same as when they occur under similar circumstances at the full time, this distinction will appear useless. For

the student, however, it is worse than useless, since it might lead him to infer that the management would require to be different. As to tedious, laborious, and impracticable, these different terms express merely the same condition; for if the labour be tedious, although the patient has little corporeal, yet she may experience much mental suffering, which is equally, if not more injurious and harassing; and if labour be impracticable, or, more properly speaking, cannot be accomplished by the natural efforts, no one will doubt that it is laborious.

The arrangements pursued by continental authors, especially the French, are, to say the least, unnecessarily complicated and artificial, and calculated to confuse the student. Baudelocque, for example, though a highly gifted practitioner, and also M. Gardien, one of the latest systematic writers on this subject in France, specify no fewer than six different varieties of natural labour, or head positions, for each of which both of them lay down specific rules of practice. In the first, the vertex is supposed to be placed to the left; in the second, at the right acetabulum; in the third, behind the pubes; in the fourth towards the sacrum; in the fifth, at the left sacro-iliac symphysis; and in the sixth, at the right.* It will presently be seen, that when the fœtus is in either of the two first positions, the natural efforts are generally adequate to the delivery, and that the management of both is the same. Some writers doubted the existence of a third and fourth altogether, but in pelves of which the long diameter at the brim extends from pubes to sacrum, such presentations may certainly happen; and pelves of this formation are occasionally met with. The fifth and sixth frequently require manual interference, and cannot therefore be considered under the head of natural labour, in which it is unnecessary to distinguish more than one order.

The classification of Dr Denman, so simple and comprehensive, is yet unequalled by that of any writer. He proposed the following division; viz. natural, laborious, præternatural, and complex. No labour can occur which may not with propriety be referred to one or other of these classes.

* The following are Professor Nœgelè's head positions: *first*, the right parietal bone is the presenting part of the head; the small fontanelle is directed to the left side of the pelvis, and more or less towards the pubes: in the *second*, the left parietal bone presents, the small fontanelle is directed to the right side, and more or less towards the sacrum. He has two face positions, in the *first* of which the right half of the face presents—the forehead being towards the left side of the pelvis: in the *second* face position, the left half of the face presents—the forehead being placed towards the right side of the pelvis. In thirty-one instances of these face presentations, the first occurred twenty times. —Lehrbuch der Geburtshulfe, pp. 214, 230.

Sect. I.—*Causes of Labour.*

On this subject the profession have been much divided, and some extravagant notions have been advanced. It is unnecessary to disprove by reasoning, that the fœtus is the principal agent of its own birth; or that the desire for nourishment, necessity for respiration, acrid quality of the liquor amnii, or the troublesome weight of the meconium are the causes which excite uterine action. Neither do we require to expose the absurdity of those who ascribe to the fœtus itself the sagacity of effecting its own emancipation, by pressing its head upon the os tincæ, and pushing the feet and nates against the fundus uteri, though it has been overlooked by those philosophers, that, where a woman produces a still-born child, which cannot be endowed with such power of intelligence, the uterine aperture is dilated with *almost* as much facility and expedition as when she gives birth to a *viable* production. It may be presumed, that when the child is alive and vigorous, its frequent movements and firm texture will excite the uterus to stronger action, and to the more speedy removal of its contents than can happen when the body it contains is plastic and quiescent.

To support the notion that the fœtus is an important agent in parturition, cases have been related where it has been expelled after the death of the parent.* Examples of this nature, however, admit of a more rational explanation; for frequently indeed the former dies before the latter. But after the death of the mother, the vitality of the uterus, of which there is a great augmentation during pregnancy, does not immediately cease; hence, then, with that general relaxation consequent on dissolution, the cause of the escape of the ovum in such cases. If labour be somewhat advanced when the parent has sunk, the pressure to which the uterus is exposed from the ambient organs, and, in some instances, from the rapid generation of a large volume of air in the intestines, may be deemed sufficient to accomplish the expulsion.

Distension, pressure, and consequent sympathetic irritation of the general system, are more feasible causes of the commencement of uterine action. But, as formerly stated, the uterus is rarely præternaturally or even fully distended;

* Med. Reposit. for 1817, contains the case of a woman who suddenly died of convulsions in the eighth month of pregnancy. The nurse who was sitting by the corpse, observed the abdomen rising, which alarmed her so much that she fainted. The body was not moved for two days afterwards, when a fœtus was discovered between its thighs. Dict. des Sci. Méd. vol. xxxi. Art. *Matrice*. q. v. La femme Homer mit au jour un enfant mort, trente-quatre heures après cesse de vivre elle-même. Velpeau, vol. i. p. 402.

and though it cannot be denied that irritation and interruption to the functions of some of the great vital organs, as those of respiration, circulation, and digestion, from the enormous bulk of the uterus, have some share in exciting its action, particularly in cases of plural births, yet under other circumstances, such causes would rarely seem to exert any influence, for we find that the fœtus is thrown off at various periods of pregnancy, where neither these nor any other obvious cause can be traced. In reference to distension of the uterus, it should be remembered that this organ grows, and is not mechanically distended like dead animal matter or elastic gum. Sometimes in deformed females, the uterus acquires a habit of prematurely evacuating its contents.

Two sets of organs are concerned in this important function, viz. the uterus and the abdominal muscles, including the diaphragm. The causes by which these are called into operation, may be accidental and give rise to abortion or premature labour; or they may consist simply in a natural disposition of the uterus to rid itself of its contents, since they act in the great majority of females nearly at a stated period. Of the latter we know no more than of other functions of the animal economy which are in constant operation before us, but for which we are unable to account, since they are regulated by laws that are beyond our investigation. In the fifth month, the cervix uteri, which hitherto has suffered little change, and appears to be a mere *corps de reserve* for enlarging the uterine cavity, now begins to undergo a process of effacement. This change gradually proceeds till the close of gestation, when, generally, the cervix can no longer be defined. As the ovum now occupies the interior of the cervix equally with the rest of the organ, its fibres are unfolded in a ratio with the increase of its contents, and progressively dragged upwards towards the centre of the uterus, until the margins of its aperture are actually separated. From the time this change is effected, and the cervix completely effaced, the os uteri is exposed to the continual pressure and irritation arising from the weight of the ovum, which is pushed against it by almost every movement of the body, whereby general action of the organ is at last established, and consequent dilation of its aperture progressively succeeds.

Sect. II.—*Symptoms of Labour.*

This function is ushered in on many occasions without any precursory phenomena; but generally it is preceded by a va-

riety of local and constitutional complaints. These vary but little in the commencement of the process in the different labours of the individual, to whatever class it may eventually be necessary to refer the case.

Some women suffer much from oppression and anxiety for many days or even weeks before uterine action is established. In most individuals there is a discharge of glairy or sanguineous mucus of a peculiar odour, or watery fluid, per vaginam, for some days before there is any evidence of labour: by the sex these are styled *shows*, and they are sometimes so copious as to be mistaken by inexperienced females for the liquor amnii. These discharges are derived from the glands of the cervix uteri and vagina, and when they present a sanguineous appearance, this must be ascribed to a rupture of the minute vessels which connect the ovum to the uterus. Rigors and other febrile symptoms, are occasionally among the premonitory signs. Strangury, from the pressure of the uterus upon the neck of the bladder, is often complained of. Sometimes labour is ushered in by troublesome tenesmus and diarrhœa; very frequently the bowels are constipated.

After a woman has given birth to several children, labour is often preceded, especially in patients of a shattered irritable system, for many nights, by pains very much resembling those of cholic. Except for a night or two before uterine action commences, such complaints are rarely experienced in primary pregnancies. Subsidence of the abdominal tumour is a circumstance of frequent observation, for a few days antecedently to labour. In some instances the abdomen is apparently so much reduced in size, that pregnancy would scarcely be suspected. Such a change may be considered favourable, as it indicates a capacious pelvis. The patient becomes more alert and cheerful, and feels actually lighter, probably from the diaphragm being permitted to descend lower in the abdomen and respiration being less restrained, and the pelvis now affording better support to the ovum, which was previously more pendent in the abdomen, and thrown somewhat from the centre of gravity.

With the internal changes of the uterus, the practitioner has seldom an opportunity of becoming acquainted, as under circumstances of urgent necessity even, females are naturally reluctant to submit to an examination of these organs. We know that the os uteri, especially in females who have formerly had children, and occasionally also in those who are for the first time pregnant, dilates insensibly for some days before there is any general uneasiness of the organ. In a first pregnancy, there are, generally, frequent pains before

there is any uterine dilatation; but in those who have formerly been matrons, the uterus may be found in a state of dilatation, amounting to one or two inches in diameter, for many days before the patient is sensible that labour has commenced. If the practitioner is aware of such a condition, the woman should be cautioned against going abroad, as a few contractions might expel the fœtus, when, probably, she was unprepared for such an event. This enables us to account for expeditious deliveries.

Sect. III.—*Spurious Pains.*

These are so styled from their differing in many respects from true uterine action; they are of frequent occurrence among females who have had several children, often most harassing in those who have had a large family, women of much nervous susceptibility, and those who are of a lax, delicate habit of body. They generally commence towards the latter part of the night, and regularly disappear on the approach of morning, continuing to harass the patient for days or even weeks antecedently to labour. Individuals in their first pregnancy seldom suffer from this kind of uneasiness, until within two or three days of the commencement of parturition, and then only when the bowels have been neglected, or some other variety of irritation has been allowed to act.

In many cases, false pains are so regular, and the patient bears down so forcibly during their presence, that frequently the attendants, and sometimes also young practitioners, are apt to consider them as general contractions; while, in fact, they are to be viewed as partial action, or an excited state of the uterine fibres, at particular points. When the causes which produce them are of protracted application, these fibres are excited by consent, or regular labour pains even may at last be established.

The most frequent cause of false pains is torpor, or over-accumulation in the bowels; and to this may be added, surfeiting, the abuse of cordials, mental disturbance, bodily fatigue, night watching, febrile excitement, the irritation of hæmorrhoids, and diarrhœa. It is of consequence to distinguish these from true pains, if it were merely to prevent practitioners unnecessarily watching their patients for nights in succession, and making a ludicrous figure before the attendants. Moreover, unless the condition of the sufferer be early remedied, premature uterine action, as already stated, may be induced.

They differ from true pains in supervening late at night,

ceasing on the approach of day-light, and being entirely absent during the day; in never almost being preceded by rigors; in frequently shifting from one point to another, from the sacrum to the loins, from the latter to the abdomen, and from it to the pubes. The most certain way to mark the distinction, however, is by an examination per vaginam; if, when the index finger is brought in contact with the os uteri when the patient complains, the margin of the aperture be not rendered much firmer, nor felt contracting, the pain is to be considered spurious. When the uneasiness is of this nature, the os uteri will be felt soft and flabby *at the time*, and it can be moulded into any shape. But if, on the contrary, the uterine aperture be felt contracting, and becoming firmer during a pain, the presence of labour, or general uterine action is certain; and the os uteri will be so firm, that its shape cannot be readily changed. Or if the os tincæ be sufficiently dilated, as it occasionally is for days, or even weeks, before gestation is completed, to admit the fore-finger, it will be squeezed between the uterus and the fœtal head during a pain, when a woman is actually in labour.

The treatment will depend on the cause. Particular inquiry should always be made respecting the condition of the bowels; and where we find that they have been neglected, their proper evacuation, either by mild enemata or laxatives, is sure to afford relief. When spurious pains supervene to over-indulgence at the table, the stomach and bowels must be cleared out as early as possible, by a cathartic; and a sufficient proportion of the compound colocynth mass in pills, is the most likely to be retained. Spurious pains arising from several of the causes particularized, as mental disturbance, fatigue, and diarrhœa, are effectually relieved by opium, especially after the bowels have been properly regulated. The tincture or sedative solution of this drug may be given; but the dose of either will require to be about twice the quantity administered under ordinary circumstances. In cases where opium offends the stomach, it should be given in a thin solution of starch, as an enema, when the pains become troublesome. When this uneasiness is at any time accompanied by vascular excitement, and when the patient is full or vigorous, a free detraction of blood will be found of much benefit. Spurious pains arising from hæmorrhoids, are relieved by lessening the local irritation by means of warm cataplasms and enemata. Other causes productive of spurious pains are mentioned, but the mode of relief is too obvious to require being detailed.

CHAPTER II.

NATURAL LABOUR.

A case may be so considered, when the head presents; when, after its descent into the pelvis, the face turns in the direction of the sacrum; and when the entire expulsion of the fœtus and secundines is concluded within a period of twenty-four hours, without artificial interference. To this, like every other general rule, there are exceptions.

In the first place, the head may be the presenting part, though not the only one, nor advanced in the most favourable position to pass through the pelvis. It may be accompanied by one or both arms, a leg, even an arm and a leg, or a loop of the funis. In a capacious pelvis, the transit of the head might ultimately be effected, though accompanied by the parts specified; but in one of the ordinary dimensions, even a protrusion of the cord might lead to a retardation of this function beyond the time specified. An increase of the general volume of the cranium, to the extent which might arise from surrounding it by a common towel merely, might, in a pelvis of the ordinary size, protract the delivery, and greatly aggravate the sufferings of the patient.

Secondly, when the position of the head in its transit is such, that the face shall be directed towards the anterior instead of the posterior part of the pelvis, this, in a basin of the ordinary standard, and of regular formation, exerts a material influence on the duration of parturition. For, in this presentation, there is a want of correspondence between its diameters and those of the *brim* and *outlet* of the pelvis: it will require, when placed as described, a space of nearly half an inch more, than if the occiput were directed towards the fore part of the pelvis. Moreover, when the face, during the descent of the head, is forced into the arch of the pubes, no part of it, on account of its expanded surface, and the incompressibility of the bones which form it, can insinuate itself through this arch; so that, literally speaking, we have in such a case, the whole of the head confined within the walls of the pelvis. Here, then, the transit of the cranium is not only resisted, but the sufferings of the patient increased, from the pressure to which the linings of the passage are exposed. When the occiput, however, during the descent of the head, is forced into the arch of the pubes, it is enabled, from its diameter being less than that of the face, and

from the bones of which it is composed being compressible, to insinuate itself considerably through this arch; from which it results, that as the whole of the head is not confined within the pelvis, there is less pressure on the linings of this cavity, and the sufferings of the patient are not so acute.

Thirdly, although, by the definition offered, the duration of the case, in natural labour, has been extended to twenty-four hours, yet few examples occur which require so long a period. Every thing depends on the power exerted by the propelling agents, the relative proportions of the head and pelvis, and the disposition of the parts to dilate. Hence, in many instances, the whole process may be concluded in three or four hours; for in one patient the labour will advance as much in this short space, as in another during four times the same period. Occasionally after uterine action has been regularly established, it may, for a time, become suspended, in which case, the labour must be dated from the commencement of reaction; lest, by including the period of suspension, the duration of the process might exceed that specified in the definition, and interference be unnecessarily resorted to.

Fourthly, that clause in the definition, which refers to the version of the face towards the sacrum, is the most unexceptionable part; since, in a case which is strictly natural, this must happen; and since a deviation from it almost invariably adds to the sufferings of the patient.

To afford a definite idea of the compound operation of the organs more immediately concerned in parturition, and of the progress of the fœtus through the pelvis, labour has been divided into stages: these, it will be of the utmost importance for the practitioner to distinguish, because the phenomena attendant on each, the responsibility in as far as the safety of the mother and child is concerned, and the duties required of the medical attendant, *differ most materially*. Of all the divisions proposed, that recommended by Dr Denman is the best. He marked three stages in this function. The dilatation of the os uteri to that extent which will suffer the head to pass, constitutes the *first;* the transit of the fœtus *per pelvem*, the *second;* and the detachment and exclusion of the secundines, the *third stage*.

Sect. I.—*First Stage.*

In this division of the process, no sensible change is perceived in the position of the fœtus; the uterine aperture is the only part which experiences any marked alteration. The head, unless the pelvis be large, rests on the brim during the

first stage. It is ushered in by frequent, teazing, rather than effective pains, of short duration, which generally commence in the sacrum, and extend rapidly to the pubes; or they begin at the latter point, and dart towards the back and upper parts of the thighs; the patient, on their accession, evincing a disposition to grasp for support, whatever is within her reach. At this moment the countenance becomes flushed and contorted. When females have formerly had children, the contractions are often at first described as affecting the centre of the abdomen, while the back is unaffected. The sex themselves imagine, that these are not so effectual as when they are situated in the back; and, as they would seem to be limited to the body of the uterus, without extending their influence to its aperture, this notion is at least plausible. At first these pains do not continue above a few seconds or half a minute; their duration is so trifling, that the patient represents them, as if from time to time she was suddenly seized by a catching or grasping sensation over the abdomen. As they recur, they continue longer, extend more along the fore and back parts of the thighs, and become general over the abdomen.

During the intervals between the contractions, the patient is disposed to be drowsy, or she sleeps when they subside; but at other times there is much irritability and watchfulness. There is deep nausea or actual vomiting, but these symptoms are more frequently met with in the second stage, and are rather favourable than otherwise, since they are succeeded by relaxation, which conduces to a more speedy dilatation of the passages. From a knowledge of this circumstance, however, vomiting should not be excited artificially, lest, by the abdominal muscles being thrown into violent action, premature detachment of the placenta might result. The rejected matter consists of the ingesta, bile, or mucus: when the latter, the efforts to retch are distressing, and the os uteri is rigid and slow in dilating. The vascular system indicates little derangement, most generally the pulse is good, though during every contraction it is excited; but except when uterine action is violent or long continued, the acceleration is but temporary. Sometimes when sickness or vomiting supervenes, the pulse becomes slower than natural, and contracted; but after a discharge from the stomach, it returns to its former condition. Occasionally there is a sensation of syncope, but this is not frequent.

The pains complained of, are the contractions of the uterus, as may be determined by placing the hand on the abdomen, when, as the uneasiness supervenes, the uterus will be felt

becoming gradually harder; or if a finger be introduced within the os uteri, additional evidence of contraction is thus afforded, by the latter firmly embracing the former. Though to the powerful action of the muscular fibres of the uterus, and sympathetic excitement of almost the whole muscular system, must chiefly be ascribed the sufferings experienced by the patient, yet the temporary irritation of the nerves of this and other organs more immediately concerned, as also the pressure exerted on the ambient parts, and the mechanical distension of the passages, must all be allowed their due influence;—in proof of which, it is merely necessary to state, that during a primary labour, from the greater resistance, as also during the second stage of any labour, from the pelvic linings being exposed to pressure, the pains are most severe; while it is equally well known, that in a woman the reversely situated, her sufferings, generally speaking, are neither so acute nor so protracted. Although far the major part of the sex bring forth with pain, yet some few are met with who have very little, or none at all. I knew a lady who in three successive confinements, was not aware that she was in labour, until, on rising from an arm chair on which she had been sitting, a sensation was communicated to her, which compelled her to call for assistance, and she could scarcely be got to bed in the same room, when the child was born.

What requires to be accomplished in this stage, is the dilatation of the aperture, since it has already been stated, that the cervix uteri is, in by far the majority of instances, completely obliterated before labour commences. The opening of the os internum is effected chiefly, *first*, by the reiterated contraction of the muscular fibres of the organ; and, *secondly*, by the pressure of the membranes of the ovum. In speaking of the structure of the gravid uterus, it has been noticed, that its fundus and body are furnished with strong muscular fibres, which constitute separate strata, that observe a circular, oblique, and perpendicular course; while in the cervix the fibres are indistinct, and consequently less powerful than those in the upper parts of the organ. As the fundus and body, therefore, will act with greater energy than the parts below the circular zone of the organ, the result must be, when it is in a state of general contraction, that the ovum, which is nearly incompressible, will be pushed toward that point where the least degree of resistance is offered; and that consequently, the cervix and os uteri will be the parts on which the impulse of this pressure must be chiefly exerted; or in other words, which must be the first to yield under the influence of this pressure. With every contraction, the head

is felt to recede a little, and the liquor amnii to be squeezed toward the most dependent part of the uterus, on which this fluid, included in the membranes, acts upon the principle of a cushion or wedge, whereby the margins of the os uteri are slowly and imperceptibly caused to separate from each other. A continuation of the same action forces a portion of this cushion, in the form of a small segment of a circle, to protrude beyond the os uteri. As the protrusion enlarges with every contraction, and acts upon a progressively extending sphere, its power of dilatation increases in a direct ratio with the size which it acquires, until a sufficient aperture is prepared for the head to pass from the uterus, which completes the first stage. When this happens, the uterus and vagina constitute but one continuous canal. The abdominal muscles are very little if at all concerned in this part of the process.

The duration of this stage not only varies in a given number of women, but even in the same person in her different births. In a primary labour it is generally slow, requiring from six to eight, twelve, or sixteen hours even, for its completion. This delay often gives rise to great irritation on the part of the sufferer, who with her sympathizing companions, sometimes becomes dissatisfied with the medical attendant and his measures, and thinks that some assistance should be afforded, that something has been done which had better be let alone, or that something has been neglected which ought to have been tried. In after labours, generally speaking, this part of the process proceeds with such rapidity, that we either find it drawing to a close, or the second stage far advanced, when we are called. In such cases, this stage is rarely protracted to the sixth hour. Very generally it is concluded in little more than half this period.

It has been attempted to calculate the number of contractions required to accomplish complete uterine dilatation, and with this intention, the sick-tender has been directed to make a notch in a piece of wood, for every pain the patient may have had in the absence of the practitioner, who would thus on his return, be enabled to estimate, without an examination, the progress of the case. At the best, this piece of practice is only calculated to keep a nurse or practitioner in their dotage, from sleeping on their post, since the progress of dilatation is influenced by a variety of causes,—as the mental energy of the patient; the general disposition of the uterus; and more especially the degree of laxity or rigidity possessed by its aperture, and the vagina.

The os uteri will be found in *various conditions* during this stage. In a first labour, from the inexperience of the sufferer,

assistance is too often prematurely requested, and no dilatation, nor even the os uteri, can be traced; or if it be distinguished, it may be so contracted as scarcely to admit the summit of the index finger; or it may be in various other degrees of expansion, from one to two or three inches in diameter; and perfectly round, or slightly oval. In the commencement, before dilatation has made any perceptible progress, the margins are often felt smooth, or polished and thick, prominent, and sometimes extremely unyielding. They become gradually thinner as contractions continue to recur, until ultimately they are rendered as thin as vellum, so that they are with difficulty to be distinguished by the finger, when the membranes during a pain are forcibly pressed upon them. When this stage is nearly concluded, the margins of the os uteri progressively resume their former thickness, and recede from around the head upon the brim; from which, during a contraction, they occasionally protrude a little into the pelvis until it is occupied by the head. When a woman has once had a family, they are thicker at all periods of labour than in her first confinement. In such cases also, the os uteri, independently of its being thicker, is corrugated and relaxed. Sometimes its anterior margin is thin, while the posterior one is thick.

The position of the os internum differs in a given number of cases. In the early part of this stage, it is more frequently placed much nearer the sacrum than the pubes or other points; but as parturition advances, it comes more into the centre of the brim. At other times it feels as if drawn toward either ilium, and sometimes, though rarely, it is felt much nearer the pubes than the sacrum. These positions, and that the os uteri is extremely thin, should be remembered, as they facilitate the removal of one of the greatest difficulties the noviciate in midwifery has to encounter; viz. tracing the os uteri in the early stages of labour.

Some estimate of the duration of this stage, may be deduced from a careful consideration of the foregoing conditions of the os uteri. A rapid dilatation never happens in the first stage of a primary labour, except when the patient is buoyant in her spirits, and of relaxed fibre. When the aperture is directed toward the sacrum, and placed very near it, the dilatation is slow. It also yields very tardily when it feels hard and painful to the touch, when its lips are projecting, when they are thick and unyielding, and when they feel smooth or polished. The celerity or tardiness of dilatation is much regulated by the energy of uterine action. The first stage is almost certainly tardy, when, in a woman who has formerly

borne children, the os uteri is of an elliptical shape. As favourable conditions towards the speedy termination of this part of the process, a corrugation and flabbiness of the os uteri may be mentioned, as also in after labours, a thin smooth state of it; and deep nausea or vomiting. Though an acquaintance with these circumstances may assist in determining the duration of this stage, yet the most experienced practitioner may fail in his opinion; hence, to prevent disappointment to the patient, and consequent suspension of uterine action, it becomes the duty of the medical attendant to be reserved in his prognosis, or in other words, not to promise too much.

Besides rigidity of the os uteri, as it is generally styled, the other states of this organ, which more frequently contribute to retard the advancement of the first stage, are, *premature rupture of the membranes* of the ovum; an *undeveloped condition of the cervix uteri; protrusion of the organ into the pelvis;* and *obliquity of the os uteri;* in which the mode of practice to be pursued will be described under the head of *Management* in natural labour.

Sect. II.—*Second Stage.*

As this period embraces the transit of the fœtus through the pelvis, as a preliminary step towards explaining why the head should pass more easily in one position than another, the measurement of various parts of the basin will now be considered, and compared with the dimensions of the fœtal cranium. The peculiarities of the fœtal head must also be pointed out, that the various positions which it assumes, and the progress which it makes, may be accurately distinguished. A great diversity obtains in the capacity of the pelvis. I have had occasion to remark, that its development is somewhat influenced by the early habits of the individual; for in women who, previous to their attaining maturity, were compelled to labour hard, and subsist on unwholesome nourishment, I have repeatedly found the dimensions of the basin below the natural standard.

In a pelvis of the natural form and capacity, if a line be drawn from the most prominent part of the crest of one ilium to that of its opponent, it will measure twelve inches, and in its transit will touch the promontory of the sacrum. From the anterior superior spinous process of the ilium to that of its fellow, ten inches; from the crest of this perpendicularly to the brim, three and one-half inches; from its anterior superior spinous process, to the symphysis pubis, five inches; from the

anterior inferior spinous process to the pubes, four inches. The length of the iliac fossa is five inches.

Although it be stated by some writers of eminence, that the brim is triangular, yet an aperture of this shape must be considered as an exception to the general rule, and that of the oval form the most natural, and this, when compared to the fœtal head, seems the most favourable shape for its transit. When this opening is of the natural size, the distance betwixt one ilium and the other, in a line directly lateral, is five inches and a fourth; in the skeleton, this is the longest diameter. In the recent subject, however, the longest, which is also called the diagonal diameter, is represented by a line drawn from the acetabulum of either side, to the sacro-iliac synchondrosis of the opposite, and measures five inches and an eighth, or a fourth. The space betwixt the ilia is diminished in the subject, by the transit over the brim, of the great psoæ and iliaci interni muscles. From the symphysis pubis to the promontory of the sacrum, which is styled the conjugate diameter, measures four inches and a quarter. At the union of the pubic bones the depth of the basin is about an inch and a quarter; from the brim, perpendicularly to the plane of the tuber ischii, three and one-half inches; from the top of the sacro-iliac junction to the tuber ischii, five inches and one-half; and from the extremity of the symphysis pubis to the point of the os coccygis, half an inch less when the pelvis is not occupied, and nearly six inches when the latter bone is pushed back by the pressure of the head during parturition. Between one tuber ischii and the other the distance is four inches and a quarter.

The angle which, in the erect position, the plane of the brim forms with a line parallel to the horizon, is termed the angle of inclination of the brim, and is between 59 and 60 degrees; so that the promontory of the sacrum is three inches and 9 or 10 lines higher than the symphysis pubis. At the outlet, measured in the same manner, the angle of inclination is between 10 and 11 degrees. In Jewesses, according to the observations of Professor Naegelè, the inclination of the brim is considerably less, and they bear their children easier than other women. A knowledge of the inclinations of the pelvis is necessary to the attainment of a correct idea of its axes. The axis of the brim will be represented by placing the upper extremity of a probe upon the umbilicus, nearly in the same state of prominence as at the close of pregnancy, and the inferior extremity upon the fourth portion of the sacrum; or, in other words, a body entering the pelvis will descend in this direction. The axis of the outlet is described by drawing a line from the promontory of the

sacrum, through the centre of the pubic arch. As the brim and outlet, however, are not parallel, but placed at a considerable angle with each other, the particular axis of each must vary according to their inclinations; and as the axis must be equi-distant from all points of the circumference, the mobility of the coccyx prevents a fixed line being given as the axis of the outlet. It is highly proper to recollect the axis of the brim and outlet, since they not only enable the practitioner to explain certain movements of the head in its descent, but must also regulate the direction in which he should exert his efforts during the application of instruments for the extraction of the fœtus.

The peculiarities of the fœtal cranium are the fontanelles, the sutures, the parietal protuberances, and the vertex. Betwixt the anterior superior angles of the parietal bones, and the corresponding points of the frontal, which are rounded off, is a quadrangular space styled large or anterior fontanelle, to distinguish it from a smaller one sometimes placed at the posterior extremity of the sagittal suture. This is known by its forming a quadrangular indentation, and by our being able to trace one of these angles, advancing anteriorly between the halves of the frontal bone. It is formed by the coronal suture, which runs across the cranium betwixt the frontal and parietal bones; and by the sagittal suture which bisects the former. In a strictly natural labour, this peculiarity cannot easily be felt in the early stages, unless the head be in an unfavourable position; but, when the process is farther advanced, the fontanelle can be traced upon the extremity of the sacrum. It is of the first consequence towards delivering a correct opinion regarding the position of the head, to distinguish the anterior, from the posterior fontanelle, which feels like a triangular indentation, or large fissure, in whatever direction it be traced. One limb of this boundary is formed by the sagittal suture, which extends from the root of the nose, divides the frontal bone into halves, and terminates at the union of the parietals with the occipital bone. The lambdoidal suture, which is placed betwixt the last mentioned bones, constitutes the other limbs of this limit. The fontanelle at this point is rarely conspicuous. Another very important peculiarity is the vertex, a term applied to the upper flattened part of the occiput. Somewhat nearer the anterior angles than the immediate centre of the parietal bones are the protuberances of that name, which are mere projections of the external and internal tables. In a strictly natural presentation, the right one of these, speaking from the result of my own experience, is what in the early stages of labour, the finger most frequently touches when introduced

in the direction of the middle line of the pelvic cavity, and not the central portion of the sagittal suture, or the vertex, as is too frequently set down in books, and inculcated in lectures.

It is of the first importance to be acquainted with the dimensions of certain parts of the cranium, as it is by comparing these with, and if possible bringing them to bear upon those diameters of the pelvis to which they have the nearest relation in regard to size, that cases of malposition are to be rectified. The longest diameter of the skull is from the chin to the vertex, which may be called its occipito-mental, and measures from four and a half to five inches. This amounts to within a little of the space which the diameters of different parts of the pelvis present, and which in natural presentations, are occupied by the head in the various positions it is forced to assume in its descent. *First*, while the cranium enters the brim in the most favourable manner, its long diameter will be placed obliquely in relation to this opening, occupying consequently its widest line, and the less it is advanced in the brim, the more nearly does its long diameter approach the transverse line of this opening, and the more will the basilar aspect of the head incline towards the sacrum; wherefore, the right ear will generally be felt behind the pubes; *secondly*, when it descends so far into the pelvis that the scalp is on a level with, or in the plane of the tuberosities of the ischia, its longest diameter will occupy that which extends from the sacro-iliac symphysis of one side, to the tuber of the opposite ischium; *thirdly*, when the face has made its nearest approach to the hollow of the sacrum, the longest diameter of the head will be placed in the space extending from the promontory of the same bone, to the centre of the widest part of the pubic arch; *fourthly*, when the head begins to pass through the os externum, the occiput with portion of the posterior upper part of the right parietal bone, occupies the pubic arch, and first protrudes; and *finally*, when the head is about to be extruded, the posterior fontanelle is rather towards the left than in the centre of the pubic arch. This position of the head at the moment of its expulsion, is best observed when this part of the function is tardily effected; then it is remarked that the sagittal suture runs from left to right and crosses the right labium, at some distance from its posterior extremity, and that the right parietal protuberance protrudes before the left.

The next diameters in point of size and importance are, *first*, the occipito-frontal, or that which extends from the

vertex to the root of the nose, and measures four inches; *secondly*, from the vertex to the chin, along the base of the cranium, which may be called the basilar diameter, and measures four inches and a half; *thirdly*, from the centre of the occiput, to the anterior fontanelle, which may be styled the occipito-bregmatic, and measures three inches and a half; and *fourthly*, from the bregma, perpendicularly to the foramen magnum, which may be termed the perpendicular diameter, and amounts to three inches and three quarters. The shortest diameter of the most bulky part of the cranium, is from one parietal protuberance to the other. This may be termed its parietal, and measures from three and a-half to four inches; but when the latter it may be considered large. The short diameter of the brim and outlet is very little larger than that of the cranium.

The practical deductions which suggest themselves, by a comparison of the principal dimensions of the maternal pelvis, and fœtal cranium, are, *first*, that a head of the ordinary volume bears such a proportion to a basin of natural formation, when the former is presented to the latter in such a position, that those diameters of each which correspond in the nearest manner as to size, are directly opposed to each other, the one will pass through the other with facility. Unless matters be thus adjusted, however, not only the cranium will not traverse the pelvis with facility, but some artificial assistance may be required; and such interference be succeeded by serious lesion of structure to either parent or child, or both. And, *secondly*, that when the head is once placed in a favourable position, this cannot be changed for one less so.

Though the foregoing be the dimensions of a cranium of the ordinary volume, yet a great variety may be observed in its size, not only among the fœtus of different mothers, but even in the progeny of the same parent. Generally speaking, the cranium of a male exceeds in size, by a thirtieth part, that of a female; and in large establishments, whose records have been accurately and regularly preserved, of the number of fœtus still-born, it has appeared that the greater proportion were males. It is proper to observe, however, that among infants of the same mother, it may *occasionally* be remarked, that the females exceed the males in size.

The second stage may very properly be dated from the complete dilation of the uterine aperture, after which the membranes protrude, are attenuated, and at last ruptured by the pressure of the liquor amnii, or in its absence by that of the head, urged into the brim by the uterus and other agents.

Of all the positions in which the head can enter, the most natural, because it is both the most frequent and most easy, is in an oblique direction, with the vertex slightly in advance, placed toward the left side at some intermediate point from the acetabulum to the foramen ovale, the face inclined to the right sacro-iliac symphysis; the right ear toward the pubes, and its opponent at the sacrum; the spine of the fœtus will be directed anteriorly to the left, while the abdomen will be placed posteriorly toward the right side of the parent. By this arrangement, the most suitable for the transit of the head, sufficient space is afforded at the sacrum to prevent injurious pressure on the rectum, and at the pubes to relieve the bladder and urethra. It is universally admitted that the fœtus, in the greater number of labours, passes through the pelvis as now described; and accordingly, in 520 deliveries in my practice, in which the position of the head was accurately marked, the face in 414 of them was placed towards the right side; and in the remaining 106, directed to the left. My friend Dr Ramsbotham jun. in his excellent work, admits the following positions, and there cannot be a doubt of the correctness of his observations: in the *first*, the face is inclined to the right ilium; in the *second*, to the left; in the *third*, to the right sacro-iliac synchondrosis; in the *fourth*, to the left; in the *fifth*, the face to the right groin; in the *sixth*, to the left; in the *seventh*, the forehead against the promontory of the sacrum; and in the *eighth*, this position is reversed.

After the liquor amnii has escaped, as the uterus exerts its action more immediately and more powerfully on the body of the fœtus, its spinal curvature is increased, and a greater approximation of the chin toward the chest, than during fœtation, takes place; whence the vertex, at first directed to the fore and left side of the pelvis, now descends a little, and approaches more to the centre of the brim. While the cranium is in this position, its occipito-bregmatic diameter extends from the left acetabulum to the right sacro-iliac symphysis; the parietal from the pubic margin of the left foramen ovale to the right sacro-iliac junction; and the occipito-mental will occupy the space extending from the left tuber ischii to the right sacro-iliac synchondrosis. The head, in this state of flexion, forced by the reiterated efforts of the maternal organs into the pelvic cavity, is felt to pass in a direction from before backward over the inclined plane of the ischium and pubes, until it is arrested in its course by the vertex coming in contact with the lower portion of the sacrum, the coccyx, and the perinæum.

From this moment the head pursues a different course; the vertex sliding forward over the inclined plane offered to it by the same parts, which, but a little before, arrested its advance towards the sacrum, is now, during every pain, felt to move in a circular direction towards the pubic arch; while the face may be perceived to turn in the same ratio towards the sacrum. Thus it may be remarked, that the head makes a quarter of a turn; but this does not commence until it is completely lodged in the pelvis. This rotation is slow in a primary labour, as it is also when there is any disproportion between the cranium and the pelvis; and when it is going on, the limbs of the lambdoidal suture will be felt approaching the pubic arch, and the integument of the vertex corrugated. A variety of causes have been assigned for this evolution, as the twisting of the child's neck, the action of the coccygei and levator ani muscles, and the influence of the spinous processes of the ischia, &c. But I have always been accustomed to ascribe it to the expulsive efforts which have hitherto forced the head in its descent to accommodate itself to the widest part of the pelvis; and which, as the long diameter of the outlet extends in a direction the very reverse to that of the brim, now also urges it to perform a pivot-like movement as it has been styled, that its long diameter might be placed in that of the outlet, as it could not pass through in the position in which it entered, without much difficulty.

After this rotatory motion has been accomplished, every subsequent contraction causes the posterior part of the head to protrude a little at the os externum, and the chin to recede from the chest. The whole pressure of the head is now received upon the perinæum, which becomes conical, hot, painful, much attenuated, resembling a portion of vellum, and carried towards the pubes, whereby the anus is unusually dilated, its sphincter paralyzed, and the contents of the rectum extruded. As the head progressively protrudes through the os externum, it rises over the pubes of the parent, while the chin performs a more extensive evolution behind, and passes successively along the sacrum, coccyx, and perinæum. With every contraction the head alternately advances and recedes, until the parietal protuberances have emerged beyond the tuberosities of the ischia, in which position it remains for a moment or two stationary, when, at length, by a severe effort it is entirely excluded, and thrown upwards on the pubes. The expulsion of the head is attended by a deep groan or a violent sudden scream, to which a calm, with an interval of relief of the duration of a few moments quickly

succeeds. The head is no sooner excluded than the face turns toward the back part of the right thigh of the parent.

At the same time that the head begins to enter the outlet, the shoulders engage diagonally in the brim, the right being placed towards the fore, and the left to the back part of the pelvis. As their long diameter is almost the same with that of the head, they occupy the whole of the superior opening. The left first descends toward the left sacro-iliac symphysis, and thereafter passes backward to the middle of the sacrum, sliding over the curvature of this bone to the extremity of the coccyx, and protruding the perinæum before the right shoulder is disengaged from behind the pubes. When the shoulders pass through the os externum, the rest of the body not only quickly follows, but the fœtus is sometimes violently precipitated from the passage. Sometimes the disengagement of the shoulders requires several contractions; or when large, some artificial assistance even, by insinuating the finger into that axilla resting upon the perinæum, whereby the extraction may be aided during a pain.

When the occiput presents at the right, instead of the left ilium as in the case just described, which however, for reasons that have not yet been satisfactorily elucidated, more rarely happens, the head performs the same evolutions, but in a direction diametrically opposite. The only difference that can be remarked in such a case is, that the face turns more slowly towards the sacrum; but even this is sometimes not very obvious. In this second head position however, Professor Naegelè places the large fontanelle at the left acetabulum, and the small one at the right sacro-iliac symphysis; the latter, as labour advances, progressively turning forwards until it reaches the foramen ovale. Although I am not prepared to assent to the foregoing opinion from my own observations, yet I hesitate to doubt that of so acute and experienced a practitioner.

The character of the contractions in the second stage, differs widely from that of such as accompany the first. They are much stronger; their duration is more protracted; the interval of ease betwixt each is longer and more perfect; and they are accompanied by forcible bearing-down efforts. These transient cessations of the contractions greatly benefit the sufferer, by affording intervals for recruiting her strength, and permitting the removal of congestions resulting from the forcible pressure of the head. During the recurrence of contractions, it may be observed, that every powerful effort is alternated by one less so, and that the patient, if at all fatigued, sleeps betwixt them; and although in this stage her

sufferings are greatly increased, she is much more patient and resigned under them, than during the trifling uterine action which occurs in the early part of labour. When a pain threatens, the sufferer prepares for a severe struggle, she clings for support to the nearest object; and, with a view to exert the propelling agents to the uttermost, she takes a deep inspiration, inclines the chest upon the abdomen, and pushes the feet against some fixed point. During this agonising contest, the countenance becomes flushed, the vessels of the head and neck congested, the circulation hurried, the temperature of the body increased; and at length, the surface is imbued with perspiration.

There are few muscles which are not thrown into action during this paroxysm; but, besides the uterus, those composing the abdominal parietes, and the diaphragm, are particularly concerned. When a contraction supervenes, a deep inspiration, as already stated, instantly follows; the condition of the diaphragm is changed from an arch to a plane, whereby it presses upon the fundus uteri; and the powerful muscular walls of the abdomen, being called into action by their consent with the uterus, press upon it anteriorly; while the organ itself, when in a state of contraction, makes an effort, conjointly with the other agents mentioned, to force its contents through the pelvis. The forcible advance of the fœtus, and the pressure which it exerts on the ambient organs, give rise to frequent inclination to empty the contents of the bladder and rectum, with numerous other painful sensations which will be hereafter considered.

The duration of this stage is regulated by a variety of circumstances, as the energy of the mind, and of the propelling agents; the relative size of the head and pelvis; the condition of the membranes of the ovum, and of the parts which close up the outlet. In a primary labour, this part of the process may extend to four, or from that to twelve hours. When the passage has been previously dilated by child-bearing and energetic uterine action, the second stage is occasionally concluded in less than one hour. For the os uteri is no sooner dilated to the necessary extent, than two or three pains push the head into the vagina, and the fœtus is expelled before the patient is scarcely prepared for such an event.

The causes which usually protract this stage, are, rigidity of the membranes of the ovum, and an unusually firm adhesion of them to the uterus, inefficient uterine action, and an unyielding condition of the parts which close up the outlet.

Sect. III.—*Third Stage.*

After the birth of the fœtus, the action of the uterus is suspended for a longer or shorter interval, according to what the patient may have endured in the preceding stages of the process. If she has suffered little, the third stage is ushered in almost immediately after the second; but if the previous stages have been protracted, we may have no indication of the detachment of the placenta for a quarter of an hour or more after the birth of the child. This stage is known to have commenced by the woman complaining of pains somewhat resembling those of colic, but situated in the lower part of the abdomen. During these sensations the placenta is detached, and an oozing of blood per vaginam, sooner or later succeeds, in consequence of the laceration of the utero-placental vessels. This effusion, unless it affect the pulse, need not disconcert the practitioner.

Whenever the fœtus has been disposed of, our next object is to determine the situation of the placenta, which is often found in the vagina; for, frequently, the same pain which accommodates and expels the shoulders, also detaches and forces the secundines into the passages, whence they are to be removed, by applying the necessary extracting force through the medium of the funis. Sometimes the secundines are not to be got rid of thus easily; and it comes to be an important question, how long their detention is to be permitted. At present, it is sufficient to state, that although their forcible removal immediately after the expulsion of the fœtus, would certainly be improper and uncalled for, yet that in other instances, it would be very injudicious to suffer them to remain until excluded by the powers of nature, as was at one time recommended, since this occasionally might require a long period, and since either rule has had unpleasant results.

The mass may be retained from torpor of the uterus, diseased structure, and consequent preternatural adhesion of it to this organ; from irregular action of the womb, erroneously styled hour-glass contraction; and from permitting it to remain too long in the vagina, it may be retained, from that canal and the cervix uteri contracting upon it.

Sect. IV.—*Management of Natural Labour.*

When a practitioner is called to attend an individual on the eve of confinement, every other consideration should yield to the summons, which ought immediately to be obeyed, lest

the case be of such a character as to require instant artificial interference. From the delicacy so natural to the sex, obstacles are encountered during the first interview with a female in labour, which must be anticipated by every man of sense, and which a patient, conciliating, and sympathising conduct on the part of the medical attendant, will alone overcome. Of all situations in life, there is none in which it is more necessary to have a proper regard to language and deportment, in whatever sphere our patient may be placed, since it is certain, that her sufferings may be alleviated or protracted, in proportion as she is satisfied and confides in the qualifications of the practitioner.

Previously to our conversing with the patient, we should have an interview with the nurse, to be informed by her in regard to the following delicate points, viz., the condition of the bowels, and of the vaginal effusion; when the uterine contractions commenced, their situation, frequency, and power; and whether they are mere spasms, or attended with much straining. The patient's apartment should be obscured, the bed-curtains drawn, and the presence of unmarried ladies dispensed with, before the practitioner enters the lying-in room; and he should obtain leave to make an examination, or take a pain, as it is termed, as soon thereafter as possible, without being urgent in his demands: his desire to do so is to be communicated to the patient, either by the nurse or other attending *matron*. If she will not submit to an examination, as occasionally happens, the necessity of the proceeding, with a view to ascertain whether the fœtus be advancing in the proper position, must be explained to her by the sick-tender.

If the woman be up, we should retire, both that she may be enabled to go to bed, and that the sick-tender may make the necessary arrangements. The best position which the patient can assume, is to place herself upon her left side, to draw the knees up towards the abdomen, while the chest should be inclined in the same direction. In this posture the muscles passing over the brim of the pelvis are relaxed, and the opening itself rendered more free. After these preliminary preparations, we return into the lying-in chamber and take advantage of the first pain; and in the mean time a little unctuous matter and a napkin should be provided. We sit with our back to the feet of the patient, to have the free use of the right hand, and to have her face turned from us, that we may avoid witnessing its painful contortions and wounding her feelings. Moreover, this position is by far the most delicate that can be chosen, since the woman may be

assisted without the least exposure. Some practitioners use the right, others the left hand during an examination; some use one finger, others two. Under ordinary circumstances, I know of no argument that can be urged in favour of two instead of one finger; and unless the accoucheur be *ambidexter*, the right hand must be preferred to the left. When a contraction threatens, the hand with a towel should be insinuated under the bed-clothes, and the index finger, previously anointed, advanced toward the vagina. In going through this manœuvre, the finger should on no account be raised to the pubes, lest we give offence. This may certainly be avoided by running it along the edge of the adductor muscles, which, in the position described, will be sufficiently prominent, and which will enable us directly to convey the fore-finger to the vagina. When it is introduced therein, it must be advanced upward and backward in the direction of the promontory of the sacrum, rather by insinuation than by force. By pursuing this course, we are the more likely to detect the os uteri. While the finger is in the passage, such an investigation should be instituted, as shall enable the practitioner to dispense for some time with a repetition of it. When our request has been conceded, the objects of the practitioner, during this examination, are numerous and important, *first*, to determine whether the individual be pregnant; *secondly*, whether she be in labour; *thirdly*, the progress this function has made; *fourthly*, the nature of the presentation; and, *fifthly*, the formation of the pelvis.

To those who know little of obstetric practice, it will scarcely be credited that occasionally practitioners are not only called, but for days kept in attendance by females, upon the supposition of their being in labour, when they are not even pregnant; but to all veteran accoucheurs such mistakes must be familiar. The error arises from some women becoming corpulent after the menses have finally ceased, and from flatulency being confounded with fœtal movement, even by experienced matrons. Owing to spurious pains we may be called to a person who does not at all require our services. We are carefully to conceal feeling any inconvenience from this conduct, and take no further notice of it to the sufferer herself, than simply, if she is a woman of sense, to explain the cause of her uneasiness, and to assure her that, for the time being at least, she is not likely to require assistance. The practitioner must neither appear displeased at his repose being unnecessarily disturbed, nor must he abruptly doubt the judgment of his patient by unceremoniously telling her

that she is not in labour, as such conduct has assuredly been followed by the loss of practice.

In a primary labour especially, it is of the first moment accurately to investigate the latter point, in order to distinguish the existence of any state which might impede the descent of the fœtus, and to enable the practitioner to determine as far as can be, the nature and probable duration of the case. We must now also ascertain the presence of pregnancy and of labour. The abdominal tumour may be distinguished, simply by passing the hand over the bed-clothes, which will satisfy the practitioner on the former head. If, on placing the finger in contact with the os uteri during a pain, it becomes firm, distended, and the membranes are felt to advance toward it, there can be no hesitation in pronouncing that uterine action is established, or is about to be so; but if during the uneasiness which the patient supposes to be a contraction, the uterine aperture be found relaxed, can be moulded into any shape by the finger, and there be no distension of the membranes, we may be assured that the patient is not in labour.

When the foregoing particulars have been ascertained, the finger is to be withdrawn from the passage and freed from all appearance of blood before the hand has been removed from under the bed-cover, by the napkin previously placed there for the purpose; and the practitioner must now be prepared to satisfy some interrogations by the patient. It is very natural for herself and those around her to enquire, if all is in a fair way, and if she is likely to be soon relieved. If the presentation be natural, the mind of the sufferer should at once be satisfied, by acquainting her that every thing is as yet doing well. By qualifying our expression in this manner, we guard against future reflection, lest any unforeseen accident might supervene. Should the presenting part not be very obvious, we say that matters are not yet in such a state of forwardness as to enable us to decide; and that in a little time it may be necessary to take another pain. As to the second question, the woman must be candidly informed, that it is impossible to determine how soon her sufferings may be brought to a conclusion, but that all fair means will be used to mitigate them, and to bring the delivery to a favourable and speedy termination.

Everything connected with the patient in this state should at all times be regarded with peculiar interest and delicacy. The practitioner, since every one can judge of his appearance and deportment, though not of his abilities, should therefore practise the art of pleasing, so far as it is conformable to the

principles of honour and good breeding. But this is not to be attempted by cant and hypocrisy, not by the performance of menial offices in the chambers of the sick, not by entering into a league with nurses and other menials, not by imposing on the uninformed by pompous and pedantic jargon, or by astonishing the weak-minded with pretended and miraculous cures,—a species of professional knavery better suited for mountebanks, than men who have consecrated their lives to the cause of science and humanity,—but by principles the reverse of all these.

When required, the time of the medical attendant should be wholly devoted to the interest of the patient. Where despondency threatens, every art is to be used to divert her mind from her state of suffering. The attendants must be cheerful and affable in their conduct, and sympathizing in their inquiries. And though the case be of a nature calculated to excite care and anxiety in the breast of the practitioner, these feelings he must sedulously conceal from the patient at least, by an encouraging and confident behaviour, as she lives on the good looks of those around her.

In the first stage of a natural labour, generally speaking, little is required of the practitioner. He may be consulted regarding the apartment which should be chosen for the lying-in chamber, and the arrangement of the patient's bed, though more generally these matters are now settled by a professed sick-tender. When we are consulted, the most spacious, best ventilated, and quietest apartment is to be selected; and a hair mattress should be preferred to a feather bed, which would both over-heat the patient, and render her inaccessible to the practitioner. On the top of the mattress, it is usual to place a dressed sheep skin, then a folded blanket, and lastly a bed-sheet; all with the view of preserving the bedding from being destroyed by the liquor amnii or other discharges; and with the same intention, some women use a temporary couch until after delivery, when they are removed to the bed in which they usually rest. But it is a safer plan to have them placed in this latter from the first. For dress, articles made of cotton should be preferred in winter, those of linen in summer, but every thing of this nature is so familiar to the sex, that we are scarcely ever consulted.

Should parturition supervene during the day, it is oftener tedious than rapid; and in the former case it will be better to encourage the patient to walk about her room, while to drive away ennui, a cheerful turn should be given to the conversation. When labour comes on in the night-time,

which is more frequently the case, owing to the uterus, probably, being called into action by consent, from the system being more excited in the evening, the woman, unless she is averse to it, should be permitted to indulge in her bed, as she will often from habit sleep betwixt the pains, and the time will pass away unknown to her. To renovate the corporeal energy of the sufferer, and to guard against mental irritation, the room should at all times be kept freely ventilated, and with the exception of the nurse and one other female, all visitors of this class should be interdicted.

The examinations during the first stage, require to be conducted with great tenderness; and at all times, with delicacy and circumspection. It has already been advised that we are to have recourse to them during contractions, since, were it done in their absence, we should most certainly excite one, which would cause the individual to take a dislike to the practitioner. Moreover, by examining while the uterus is excited, we are the more able to determine how far labour is advanced, from the os uteri being distended by the membranes. No attempt must be made to determine the nature of the presentation during a contraction, lest the membranes might be ruptured. The finger is to be retained until the pain ceases, when the requisite freedom may be safely used; and if the triangular indentation already described can be perceived in the vicinity of either acetabulum, except an occasional examination, to ascertain progress, it often happens that no further interference will be required in this stage. In the most tedious case even, where there is every reason to believe that the pelvis is sufficiently capacious, these examinations ought not to be repeated oftener than three or four times, as such conduct might offend the delicacy of the patient; lead, in the absence of a supply of mucus, to injury of the parts; to rupture of the membranes; and to suspension of uterine action, from the woman, in consequence of frequent fingering, becoming alarmed, upon the supposition that there was something very unusual in her labour.

Since this part of the process is mostly slow in a primary labour, the constant presence of the medical attendant in the lying-in room, would not only be unnecessary but highly improper; unnecessary, because in very many instances there is little to do; improper, since the woman requires from time to time to attend to the calls of nature. Moreover, were the practitioner to be in continual attendance, it might lead the patient to think that she was in a case to require assistance, or that there was a prospect of her obtaining

speedy relief; but neither of these expectations being realized, fear, despondency, and suspended uterine action might ensue. Or let us suppose that the practitioner is quite a novice, and that partly from inexperience, and partly from a laudable desire to act a conscientious part towards the sufferer, he has remained with her from the commencement of labour, he might himself at last become impatient and interfere unnecessarily, which might lead to very unpleasant results in a case that had not only been natural at first, but might in all respects have terminated so by proper management. Wherefore, during the first stage, when tedious, the practitioner should merely repeat his visits occasionally; or if compelled to remain by the patient, and if his other avocations will permit his dedicating the whole of his time to this solitary case, he should be furnished with a separate apartment, whence, as occasion may require, he can step into the lying-in chamber. Though it is best at all times to pursue a fair open conduct towards the sufferer, yet I feel satisfied that in a primary labour at least, it will be advantageous to conceal from the patient that the process has commenced, until the first stage has made considerable progress, that so much time may pass by unknown to her.

It has long been very properly agreed upon, by the most experienced accoucheurs, that the more nature is left to her own resources, in this important function, the better; and though in the commencement of the process, especially in a woman who has already borne children, we rarely encounter an exception to this salutary advice, yet I would not be inclined to go the length some of the first authorities in the art have done, by denying the necessity of all interference whatever in the first stage of natural labour; for assuredly examples occur in which practitioners, by the adoption of such a principle, have had cause for poignant and lasting regret. In a primary labour, more particularly, the first stage may be protracted for such a length of time, by causes to be immediately considered, as to lead to diminished energy of the mind, and of the organs concerned in parturition, as a sure consequence. Despondency and consecutive torpor of muscular action are results of daily annoyance to practitioners of midwifery, from long continued uterine exertion. Hence, when stronger efforts of the propelling agents are required, as in the second stage, we find their power subdued or greatly exhausted, and incapable of performing their office. Admitting, however, that the organs in question are still endowed with the necessary energy to accomplish the expulsion of the fœtus, there might not be sufficient

power or irritability left, to effect the subsequent contraction of the uterus, in time to secure the patient from hæmorrhage. There must be few practical men who have not experienced the truth of these observations.

When uterine action has been for some time regularly established, without being attended with those changes which indicate the progressive advancement of labour in the ordinary ratio, the practitioner is not to remain an idle spectator of the woman's sufferings; he must not be satisfied until he has discovered the cause which retards the progress of the case; and if his own experience has not been sufficiently ample to enable him to do so, he is bound to request additional assistance. No time can be specified at which it may be said that we should, or should not interfere; when the cause by which uterine dilatation is retarded, has been discovered, then is the time for interference, even if the woman should have been but a few hours in labour. To prevent protraction of the first stage, is certainly an object of the greatest consequence, and one to which the mind of the medical attendant must, therefore, be continually directed, that the energy of the propelling organs may be economised, to enable them to support and execute the more laborious efforts required for the completion of the second stage.

The most frequent cause by which, in a primary labour, the first stage is retarded, is rigidity of the os uteri, or literally speaking, that unyielding disposition of the aperture usually met with in young healthy females, as also in those who are well advanced in life before they have become mothers. In this condition, the os internum feels projecting, smooth, and polished, as if covered by a piece of thin bladder. In such cases the sufferings of the patient may be protracted from ten to sixteen hours, before the first stage has made any considerable progress. The most marked benefit will be derived from venesection, carried the length of causing a tendency to syncope. When this has been resorted to, and I must say that we rarely meet with a primary labour in which there is any thing to contra-indicate it, the practitioner should make it a rule to visit the patient in an hour or two afterwards, lest the fœtus be expelled in his absence; such is the rapidity in many instances, with which I have known this remedy to act, upon the sole principle of its producing relaxation. In after labours, I have never felt this state to exist in such a degree as to require venesection.

The next cause, in point of frequency, of protraction of the first stage, is premature rupture of the membranes. There can be no difficulty in understanding how this acts, since it

has already been stated, that the membranes, including the liquor amnii, are a principal agent in dilating the aperture of the organ. Here also, venesection, upon the same principle as in the preceding cause, will prove highly serviceable. It is proper to remember, however, that premature rupture of the membranes, except in a primary labour, rarely interferes materially with the progress of the first stage.

The third cause of protraction, which is protrusion of the uterus into the pelvis, is not unfrequently brought about by *the last.* When the membranes have given way too early, the fœtal head comes into contact with the uterine parietes; violent action of the organ then ensues; and the diaphragm and abdominal muscles being called into operation by consent, the cranium, surrounded by the womb, is forced into the basin. When the uterus protrudes into the pelvis, it is sometimes arrested betwixt the cranium and some part of the cavity, and at whatever point or points this happens, there the whole uterine action will be expended, without extending its influence to the aperture of the organ. This is an insidious case, which presents a combination of two stages, and requires to be closely watched: of the *first* stage, since there is but a limited dilatation of the os uteri; and of the *second*, because the head is far advanced in the pelvis. Besides protraction, a case of this kind may be productive of another evil, viz. rupture of the uterus, from pressure and strangulation of the organ. If it be a primary labour, we should premise blood-letting; and during a pain, the cranium should be raised a little in the pelvis, and supported upon the fingers, to relieve the uterus from pressure, and in order that this organ, by its own action, may gradually recede upon the brim. The patient should be directed to bear down as little as possible during the contractions.

A fourth cause of retarded uterine dilatation, is an undeveloped state of the cervix uteri; often talked of under a variety of appellations, but rarely met with, if I may be allowed to speak from the result of my own experience. By some, this state is described as an œdematous swelling of the os uteri; while others talk of the first stage being delayed by an undeveloped band of the fibres of the cervix. I believe that these different opinions amount to the same meaning, and that the best expression of the fact is, that a portion of the cervix is in the same condition in which we find it on the approach of a premature labour. As some time will be required for the expansion of the undeveloped cervix, and as this process must be accomplished before the distended membranes can exert any

influence on the os uteri, the principle on which the first stage is retarded in such cases is obvious. Here also venesection to such an extent as to make an impression on the pulse will be found of great utility. I have met with such a state in primary pregnancies only.

In all the causes of protraction which have now been considered, the tincture of opium given in the form of enema, to produce relaxation, has been of great utility where venesection has failed to effect this object. Two drachms of the tincture, added to a solution of an equal quantity of starch, in four ounces of tepid water, is an eligible mode of exhibiting it. But here I think it proper to caution the novice against that indiscriminate employment of this drug, which is so general among our younger members during their attendance on women in labour, that it ought to be severely reprobated. In the foregoing causes of protraction, venesection should always have a fair trial before this medicine be exhibited, lest it might be followed by such torpor of the uterus, as should retard the contraction of this organ after its contents have been evacuated.

By obliquity of the os uteri, the fifth cause of protraction of this stage, is meant the removal of the os tincæ from the centre of the brim. Primary labours are those in which this condition is most frequently met with, and in which also, it exerts much influence in retarding the dilatation. Some persons, trusting rather to reasoning than to the evidence of their senses, consider this an imaginary state. But if it be admitted that the first stage is advanced by the pressure of the distended membranes, a fact which is known to every tyro, and that this distending power is most direct and efficient when exerted in the axis of the brim, it must follow as a natural conclusion, even were it not confirmed by practice, that when the os uteri is removed from the more immediate sphere of this pressure, retarded dilatation must be the consequence. The practice which should be pursued is simple and strongly corroborative of the explanation offered. One or two fingers are to be introduced within the os uteri, which is to be cautiously drawn into the centre of the brim, in which position it must be retained, exposed to the full pressure of the ovum, until the edges of the aperture are attenuated, and begin to yield freely.

The only complaints which require to be palliated in this stage are, vomiting and thirst. As mild diluents, the only remedies that should be allowed for the latter, are apt to induce the former, the patient must be cautioned against their free use. Vomiting cannot be suppressed; and this

is a matter of little moment, since it is rather salutary than otherwise by promoting the first stage. If the ingesta be brought up, it will be better to encourage their thorough rejection by some mild tepid diluent; but when there is nothing vomited except mucus, a moderate detraction of blood will prove the most useful practice; and effervescing draughts may be allowed.

From the time the second stage is ushered in, the practitioner must not quit the dwelling of the patient, more especially if she has formerly had children; for in such cases, the remainder of the process is occasionally completed with amazing rapidity. Sometimes a woman is not sensible of having had more than three or four contractions after the membranes have burst, which may be perfectly correct, and easily accounted for. A second labour is generally the most expeditious of any; for after the passages have been once dilated by child-bearing, the resistance which they afterwards offer to the transit of the fœtus is trifling, compared to what is felt in a primary labour. Moreover, when the system is relaxed from any cause, as disease, or frequent child-bearing, the os uteri may be expanding insensibly for days, until it is sufficiently distended to suffer the head to pass. When this happens, one or two pains throw it down upon the external parts, which, from their relaxed state, are forced by one or two additional efforts, to give it exit.

The examinations require to be more frequent during the second stage, to determine the progress of the case; and if we proceed with dexterity, they may be instituted almost without the patient being aware of our proceeding, owing to the greater dilatation of the vagina from the proximity of the presenting part to the vulva. The advance of the head is to be judged of by the extent to which the back part of the pelvis is filled up, which must be completely occupied before the cranium can be expelled.

From the commencement, a soft warm napkin should be kept constantly applied to the vagina, or birth, as it must always be styled to the sex; but this direction is more necessary to be observed in the second stage, since there is generally at this period, an increased flow of mucus, which, as well as the liquor amnii, should not be permitted to escape on the bed-clothes. For the comfort of the patient also, these napkins should be changed as often as they become wet. The ovum, forming a tumour not unlike a child's head, protrudes in most cases, to a great extent into the cavity of the pelvis, and in some instances even beyond the external parts. In a first labour, the membranes should be

allowed to dilate the vagina freely, before they are ruptured; for they accomplish it with more ease and uniformity than any other power. When the liquor amnii escapes, which should be favoured when the membranes begin to protrude through the external parts, the flow of mucus from the passages then increases, and this accelerates both their dilatation and the transit of the infant. In this stage, it is usual to tie to the bed-post a towel, which the patient, with a view to greater exertion, pulls during pain; and she also thinks herself much benefited by having the feet supported. In whatever posture she may have been placed in the early periods of the process, the position formerly recommended for examination, should now be assumed; and a small pillow placed between the knees will add to her comfort, and facilitate the operations of the practitioner.

As the fœtus descends, its pressure affects the urinary bladder and rectum; hence constant inclination to discharge their contents. So long as there is no chance of the head being expelled, the patient must be permitted to rise to attend to these urgent calls; but after the perinæum comes to be firmly pressed upon, she must be informed by the nurse that this indulgence cannot be granted lest the recto-vaginal septum be injured; and a supply of napkins must therefore be furnished, to meet the necessities of the sufferer.

A variety of other complaints harass the patient in this stage. Sometimes there are rigors, which may appear early in the process, or not until the head is lodged in the pelvis; or they may not be present until immediately after parturition, when occasionally they are very severe. Bottles of hot water must be applied round the body, and some mild cordial, such as a little white-wine negus, allowed, a moderate dose of the tincture of opium, of the tincture of valerian, or half a scruple of camphor in form of bolus.

When this stage is protracted, the sufferer is sure to become despondent; and this is one of the most annoying circumstances to be encountered during parturition. The patient calls out that she is not making any progress, that she will never get better, that she is dying; and many other discouraging expressions of a like nature are used, which are much calculated to alarm the attendants, and unhinge a young practitioner. In all cases, the medical attendant is to judge of the amount of danger, by the condition of the pulse and of the passages, and not by the clamour of the inmates of the lying-in room. When the structures of the parent begin to suffer from pressure, such a condition never fails to accelerate the circulation; but it is proper to be aware, that

under judicious management, parturition though very severe, may be going on *for many hours, or several days even*, without affecting the pulse. So long, therefore, as this function shall continue undisturbed, the medical attendant may keep his mind at ease. But he must appear steady, confident, cheerful, and obliging, while a similar line of conduct must be pursued by others, with a view to inspire the patient with hope. Every effort must be made to support the woman's spirit; for if this despondency be allowed to gain ground, suspended uterine action is a certain result, and we may find it necessary to refer the case to a different class of labours. Such results may be brought about by the practitioner himself even, who, instead of being attentive, occupies his time when parturition is at all tedious, in reading or writing, which induces the woman to think that she has yet long to suffer, and depression of spirits is the consequence. When there is the least tendency in the contractions to become lingering, the attendants must redouble their efforts to support the confidence and drooping spirits of the patient. The apartment must be freely ventilated; and the use of wine and spirits, which the female attendants are but too often inclined to administer on occasions of this nature, must be resisted.

In the early part of the second stage, the sufferer is frequently much annoyed with irritability of stomach. The organ rejects every thing; and there is sometimes the most violent retchings, even when there is nothing swallowed. This complaint is to be relieved as already directed in the management of the first stage. Sometimes it continues to harass the patient after delivery, in which case abstemiousness in nourishment of every description must be enjoined; the bowels are to be attended to by enemata; and a half-grain pill of solid opium every alternate hour until the irritation subside, should be ordered.

Pain in the sacrum is another troublesome complaint during this stage. Not above one in a hundred escapes it; and in this instance there may be a sensation, equally excruciating, in the region of the pubes. In the sacrum, the uneasiness must be referred to the pressure of the head upon the nerves and other ambient parts. Counter-pressure externally is the only method of affording relief; and to this end, the nurse takes up her station at the bed-side, and applies the hand upon the sacrum on the recurrence of pain.

Spasms of the pelvic limbs are occasionally attendants on the second stage. Sometimes they pursue the course of the crural, at other times that of the great sacro-sciatic nerves,

more especially when the head is long retained. During their continuance, they are productive of the most excruciating sensations. The usual remedies are dry frictions with the hand, ligatures around the affected part, and a cold smoothing-iron applied to the sole of the foot.

From the time the head begins to press on the external parts, the practitioner must not quit the bed-side, for now an important duty devolves upon him; which is, to support the perinæum lest it be lacerated by the too rapid expulsion of the fœtus. Instead of supporting this part, others again recommend pressure to be directly applied, by the points of the fingers, to the head itself, to moderate its advance until the os externum be sufficiently dilated. It is very well known to every one who has practised extensively, that the perinæum has been injured under the utmost caution and most judicious management; while it is no less true that it has often escaped unhurt, even when it must have been utterly neglected, as in females who have brought forth without assistance. What conclusion is to be deduced from these facts? Simply this, that if the patient were to control her exertions, as is often done by females producing illegitimate children, the accident would be of very rare occurrence, whether support were afforded to either part or not. The circumstance of those who are assisted meeting with the accident, and women delivered alone escaping it, proves pretty clearly that injudicious efforts on the part of the patient are the most frequent cause. What takes place during the delivery of each of these classes, affords farther support to this opinion. Females who are assisted, exert themselves to the utmost of their power during the pains, totally regardless whether their struggles may be heard or not, whereby the passages are hurriedly, or prematurely distended, and the accident in question, very liable to be produced. The mothers of illegitimate births are those who bring forth unassisted, and to preserve their character have good cause for concealing their situation; they therefore bear the child under restraint; or in other words, with a view to conceal their indiscretion, they do not exert the propelling powers so energetically as the mothers of legitimate infants, so that in them the external orifice is dilated with slow and uniform gradation; and consequently, with less risk of injury. As the conduct of the woman, therefore, conduces to it, when the vertex begins to emerge from the vagina, she should be enjoined to strain very moderately during the transit of the cranium; and although the hand is not certain protection, yet, as it will assuredly assist, it would be highly improper in a practitioner to withhold it under any

pretence. Uterine action is occasionally so powerful, that were it not for this precaution, the fœtus would be precipitated with such violence from the passages, that not only would the perinæum suffer injury, but the uterus even might be inverted. To guard the more effectually against any thing of this nature, whenever the head is born, let the practitioner apply the left to the perinæum, and the right hand around the neck and over the shoulders of the infant, to moderate its advance. Sometimes the fœtus does not pass per vaginam, but penetrates the centre of the perinæum, and makes its exit through the breach, which has not been continued, however, either into the rectum or vagina.

When the head comes upon the external parts, they are rendered conical by the pressure, and hence the term perinæal tumour, by men of the art. As the sex now commit a little *faux pas*, which, as it is unavoidable, must on no account be noticed by the medical attendant, viz. allowing the contents of the rectum to escape, a soft warm napkin should be applied to save the feelings of the patient. At this time, the right hand flattened, must be so placed that its palm shall cover the perinæum, while the fingers are to extend over each labium, on which parts moderate pressure only is to be exerted; for were it carried to a greater extent, we should risk injury of the organs we are so anxious to protect, from their being squeezed betwixt two surfaces harder than themselves. While the hand is thus placed, the cranium, during every pain, must be gently inclined towards the pubes, and the support be continued until the shoulders have made their exit.

Whenever the head is born, a piece of narrow tape and a pair of scissors, should be furnished. Thereafter, the cranium and neck are to be examined to ascertain if the former be covered by the membranes, or the funis entwined round the latter. As either would interrupt respiration, the membranes should be ruptured before the head has passed; and afterwards, if the cord encircles the neck, it is to be slackened or slipped off the part. Sometimes we cannot readily disengage the funis from around the neck, nor the shoulders from the outlet; and the child will be lost unless speedily extricated. When this cannot be quickly accomplished, we must endeavour to preserve the infant, by *first*, inflating its lungs through the nostrils, and thereafter dividing and securing the funis, when the shoulders are to be extricated, as formerly directed. On the expulsion of the child, we are to ascertain, by passing the hand along the woman's chest to her abdomen, whether there be another fœtus *in utero*. When

there is no more, the parietes will be found so relaxed, that the hand might almost be enveloped in a fold of them; while the uterus, contracted to the size of a fœtal head, will be felt by *free pressure*, betwixt the umbilicus and the pubes. When there is a second child, the abdomen remains hard and distended after the birth of the first; but to accomplish the distinction satisfactorily, this examination should be made as early as possible after delivery.

We are to interrupt the circulation between the parent and fœtus, whenever respiration is distinctly established in the latter. At one time it was thought unnecessary to place a ligature on the funis, as no such precaution was adopted for the security of the young of any other animal, which, nevertheless, suffered nothing from the neglect. The occasional loss of the fœtus both among the human species and lower animals, in consequence of umbilical hæmorrhage, upset this false philosophy, and gradually led to the funis being invariably secured in the young of our race. In the present day, we are advised by one class of practitioners, not to interrupt the circulation in the cord, but suffer it to discontinue spontaneously; while a second recommend the application of a ligature, whenever respiration has freely commenced. The connection between the child and the parent, must be in a great degree obstructed before the birth of the former; for as it emerges from the uterus, this organ contracts itself in the same ratio, whereby the connection between it and the placenta ceases, and the functions of this mass are destroyed. As in many instances, the fœtus is no sooner expelled, than the placenta is detached from the uterus, and forced into the vagina, of what advantage, therefore, can it be to the child, after respiration is freely established, to have the ligature withheld for one moment, since the functions of the mass must cease shortly after its detachment? While the application of the ligature is delayed, the fœtal blood continues to be poured into the arterial ramifications of the placenta; but it may be doubted whether the mass, while retained in the contracted uterus or vagina, restores by the corresponding veins, the blood which it has derived from the infant. If it does not, this must be a further inducement, after respiration has commenced, for interrupting the placental circulation, lest the fœtus suffer from exhaustion.

From what has happened in several cases that have come under my notice, I have no hesitation in declaring my conviction, that troublesome oppression of breathing, and convulsions even, may be induced by the premature interruption of the placental circulation; but certainly in the case of a

delicate fœtus, lest that blood which is sent to the placenta by the umbilical arteries, be not restored to its system, the application of the ligature ought not to be longer deferred than what is indispensable.

When the connection between the mother and child is to be interrupted, the funis, *once encircled* by a ligature of the narrowest tape, is to be firmly compressed at the distance of *two inches* from its exit at the umbilicus. Though this be at first applied with every possible firmness, yet after some little time, it occasionally becomes slack, and permits an effusion from the cord, which I have known in two instances prove fatal to the child, and in several others to endanger life. To avert consequences so unpleasant, the practitioner should examine the funis before his departure; and if it be found to permit the slightest oozing of blood, another ligature ought to be applied. This practice must invariably be observed when the cord is thick. At a distance of two inches from the first, a second ligature is to be placed, and the cord divided in the intermediate space, with a pair of blunt pointed scissors. The only necessity for this last security, is to prevent the bed-clothes being soiled by any effusion from the placental portion of the funis.

After the fœtus has been expelled, if the patient has suffered much while in labour, she should be allowed a little cordial, both to renovate the vigour of the system in general, and that of the uterus in particular. A little wine is preferable; but if the individual wish it, and if she is the mother of several children, half a wine glassful of any ardent spirit may generally be allowed without prejudice.

Among the causes by which this stage may be protracted, an unyielding condition of the parts which close up the outlet, is the most frequent. It is often the source of great suffering to those who are confined for the first time. The transit of the head over the perinæum occasionally requires a longer period than the previous part of the process. In these protracted cases, the practitioner has to contend with the clamour of the sufferer and her friends, whose anxiety must be relieved by a fair representation of the circumstances of the labour, when matters are in a proper train; by illustrations and arguments deduced from previous examples of a similar nature; and by an assurance of favourable results in due time; while to support these promises, the medical attendant must be cheerful in his demeanour, obliging in his attentions, and appear confident in his resources. If the woman has not been bled in the previous part of the process, the greatest advantage may now be expected to accrue from

this remedy; and occasionally, where it has previously been resorted to, it becomes necessary to repeat it; but in this we are to be regulated, not by representations of debility by the patient and attendants, but by the condition of the pulse, on which, before we desist, we are invariably to make an impression. *Secondly*, we are to conjoin with the foregoing remedy, the free application of some unctuous matter to the perinæum, during the intervals between the pains. This relaxes the parts, while it also diminishes increased heat, and the effects of mechanical distension. Except in first labours, however, it is scarcely ever required; but in these I feel satisfied that the greatest benefit will be derived from it. *Thirdly*, while the head is on the perinæum, and uterine action disposed to become lingering, the practitioner must be unremitting in his attentions, lest by an opposite line of conduct, the patient might become despondent, and labour suspended. *Fourthly*, if the woman has been long confined to one position, she should be allowed to change it for some other; a free current of air should be admitted through the apartment; if the patient has any desire, a little mild nourishment is to be allowed, as tea or coffee; and special care taken that the fæces and urine are regularly voided.

A second cause of protraction arises from certain conditions of the membranes of the ovum. Sometimes we find them so strong as to resist for a considerable period, the action of the uterus, long indeed after the os uteri is fully dilated: At other times, they cohere too firmly to this organ, and in both cases, resist the descent of the fœtus. When there is a correct position of the head, and the membranes do not protrude freely, but remain tense after the os tincæ is fully dilated, they should be ruptured, which may be accomplished by pinching them in the absence of a pain, pushing the finger against them when a contraction is present; or, when they are very strong, and both these methods fail, holding the point of a writing pen against them during uterine action, will speedily cause them to yield. Examples are frequently met with, where, but for our interference, the fœtus would be thrown off with the membranes entire.

In the third place, the second stage may be protracted by the inefficiency of uterine action, a state for which many causes may be assigned; as, protraction of the first stage; premature bearing-down efforts; fear; the immoderate use of cordials; overheated air; and want of rest. An opinion was at one time pretty generally entertained, that we possessed some agent capable of invigorating the uterus or

reviving its action when it became suspended; and no doubt advantage has often been taken of this belief, to impose upon the weaker sex. Both male and female practitioners have been accustomed to exhibit some kind of drops, which they endeavoured to impress on the mind of those who took them, would have the effect of invigorating the pains, and accelerating the delivery. These drops must have been the tincture of opium, which, in moderate doses, from its action as a diffusible stimulus, and its influence on the mind, from the confident manner in which it was exhibited, must occasionally have been attended with the desired effect; and hence the reason probably, why it is so often ordered in the present day, by young practitioners, without proper principles to guide them. But assuredly we are yet unacquainted with any agent that can be considered *infallible* in reviving uterine action. The ergot even, cannot be relied on, though we have of late years heard so much of its infallibility.

When uterine action has been diminished in power from fear or despondency, the stimulus of hope will prove of great advantage; wherefore, every thing must be done by those around the patient to inspire her with confidence, the effects of which are often incredible; but, without enlarging further on this point, the conduct to be pursued under such circumstances will be sufficiently understood from what has already been stated in this section. If the pains be suspended or nearly so, and the vagina and linings of the pelvis do not feel unusually tender on examination, while the finger can be insinuated betwixt the head and the sides of the basin, the best practice, more especially where the patient seems exhausted, is to suspend uterine action altogether. With this view the individual should have from sixty to eighty drops of the tincture of opium. By the temporary suspension of labour, an interval of repose is procured, whereby the strength and spirits of the patient will be recruited, and uterine contractions renewed with greater energy; but during this delay, she should be closely watched.

If the case be such that there are pains still going on, though in rather a subdued state, it is then proper to have recourse to those means which have been recommended, to excite the prostrate energies of the patient. Frictions with the points of the fingers, exerted by the nurse circularly and *firmly* over the body of the uterus, the loins, and back, are often most effectual in rendering the contractions more energetic. Camphor, in doses of half a scruple in the form of bolus, when there is no disposition to nausea, will be

found a useful agent. Cathartic enemata have frequently been recommended, and they occasionally answer our expectations; but they are more uncertain than the foregoing means; and when they do not succeed, they seldom fail to increase the torpor of the uterus. Of all our auxiliaries, Ergot appears the most active and constant in its operation. As it seems in most cases to act with great power, is in very general use, and that too by persons who probably pay but little regard to certain circumstances which, from reflection and observation, I think, should regulate its exhibition, I shall here very briefly state what has occurred to myself, in common perhaps with other practitioners, regarding it. I have known uterine action become very powerful under its use, where it was given only twice to the extent of fifteen grains of the dry powder for a dose, an interval of twenty minutes being allowed to pass betwixt the exhibition of each; and the fœtus was still-born, though, but a few minutes previous to its expulsion, its movements had been perceptible to the parent. These results are in accordance with the observations published some time since by practitioners of the United States, who found ergot so certain in exciting uterine action, that they styled it *pulvis ad partum;* and so uniformly destructive to the fœtus, that they have also termed it *pulvis ad mortem.** While I state these facts in testimony of its power, I must at the same time mention, that it has been exhibited by others, as well as myself, to a much greater extent than I have now particularized, without being productive of any perceptible uterine excitement. This uncertainty in its action, whether it arise from the quality of the drug, or idiosyncracy of habit, suggests caution in its exhibition. I think, *in the first place*, that it should not be administered in a primary labour, until the os externum be well dilated, and the vertex beginning to emerge therefrom. *Secondly*, it should not be given even in subsequent cases, till the os uteri is almost fully dilated, and the presentation natural. *Thirdly*, it should not be recommended in any instance where there is reason to apprehend disproportion betwixt the cranium and pelvis. And *fourthly*, its exhibition cannot be contemplated in any labour, except such head presentations as are strictly natural. Were it administered under any of the foregoing circumstances, and to display that violence of action which is ascribed to it, and which it has certainly in many cases produced, the uterus would often be ruptured in attempting to overcome

* Vide page 184.

the obstacles which resisted transit of the fœtus. This medicine has been given in form of infusion, decoction, tincture, and simple powder. Decoction is the mode generally preferred by the profession in the United States, who must have enjoyed more extensive opportunities of observation than practitioners of this country; but the simple powder is that in which it has always been recommended by myself. I have never ordered it in larger doses than a scruple once in twenty minutes. Drs Stearns and Hossack of New York, speak of it with great confidence, given to the amount of ten grains, in decoction. I have been informed, that Dr Blundell of London exhibits it in this latter form, and has in some instances found it quite inert.

The placenta may be brought into the pelvis after the separation of the fœtus from the parent, by applying and cautiously exerting the requisite degree of extracting force, through the medium of the funis, when we are aware of the return of pains. But whether we are informed of these sensations or not, after the infant has been disposed of, we should proceed to determine the situation of the mass. With this intention the cord is to be twice entwined round the index and middle fingers of the left hand, while those of the right are to be passed into the vagina along the funis, and if its insertion into the placenta can be distinguished, the mass should be forthwith cautiously extracted. If it be upon the brim, the funis is to be pulled, and the extracting force directed towards the coccyx; but if in the pelvis, the cord must be drawn in the direction of the pubes. When it is drawn with a long steady pull, it will support considerable force; but when suddenly and repeatedly in quick succession, a method often adopted by the novice, it is apt to be torn from the placenta, which may then require the introduction of the hand, or it may be extracted by transfixing and hooking it down with the finger. When the cord is pulled, sometimes a tearing sensation is perceptible, which may be referred to the laceration of the membranes, and not to that of the funis from the placenta. Immediately after the mass passes through the os externum, it should be twisted round two or three times, in such a manner as to bring the membranes away in a thread. In the next place, the perinæum is to be examined to ascertain whether it has been injured; and as it is better that this discovery should be made by the practitioner than by any of the female attendants, this examination should always be instituted before he quits the bed-side. If the anterior edge of the recto-vaginal septum has been at all injured, it will feel rough and exceedingly sensible to the

touch; but if otherwise, it will be smooth, and not unusually painful.

Although the placenta be thus easily removed in the generality of cases, yet examples are occasionally met with, in which it may be retained for a considerable period. How long this may be allowed, and the causes that lead to it, must now be considered. At one time some difference of opinion prevailed among accoucheurs on this point; some maintaining that the exclusion of the secundines might be trusted to nature; others asserting that their extraction should be accomplished immediately after the birth of the infant; and a *third*, directing that the practitioner should not quit the lying-in room, until their removal has been effected. A slight knowledge of the operations of the female economy, must convince every one that neither of these opinions can in all cases be followed. While the placenta is suffered to remain in utero, it is obvious that the contraction of this organ cannot be complete, and that the patient must be exposed to the risk of hæmorrhage. So long as the mass is adherent to the womb, the liability to such an accident is certainly diminished; but as there is an inherent disposition in this organ to return to its pristine state, by progressive contraction, whereby the after-birth must be detached in the same ratio, we have little security for the patient in this condition. Wherefore, the plan of leaving the secundines to be excluded by the natural efforts, from their having been so often succeeded by fatal hæmorrhage, is now entirely exploded, except by those whose practice is confined to the closet or class-room. But formidable as flooding may be regarded, other consequences no less fatal may result from long detention of the placenta. It has been followed by fever of so destructive a character, that few patients have survived its complete formation.

The practice of proceeding to the removal of the after-birth, immediately after the expulsion of the child, except where flooding threatens, is certainly uncalled for, since, if left to nature even, it would, generally speaking, be excluded within an hour of this event; and since very early interference is attended with much pain to the patient, and has been succeeded by hæmorrhage, inversion, and even inflammation of the uterus. And, *lastly*, to direct that a practitioner is not to quit the apartment of the patient until the placenta shall be excluded, betrays a want of acquaintance with certain conditions in which we occasionally find the mass, and which require it to be left in utero for many hours, or even days.

The question then comes to be, how soon after the expul-

sion of the fœtus are we to interfere, unless the after-birth be dislodged by the natural efforts? In reply, it may be observed, *first*, that when the secundines are in the vagina, they ought to be removed without delay, since by permitting them to remain, they might so effectually block up the passage as to conceal the existence of flooding; *secondly*, if there be an *oozing of blood per vaginam, with an acceleration of pulse*, such measures ought instantly to be resorted to, as shall lead to their speedy detachment and expulsion; and, *thirdly*, if they are not felt in this canal within an hour after the conclusion of the second stage, the practitioner should proceed to determine the cause of retention, and be regulated in his subsequent conduct accordingly.

If the cause of retention be torpor of the uterus, as may be apprehended where the previous stages have been severe and protracted, and where the organ itself, forming a large flabby pouch instead of a hard ball, can be felt through the abdominal parietes, ergot should be administered; the abdomen rubbed with the points of the fingers over the uterine region, or the womb cautiously grasped through the parietes, may at the same time be conjoined. Pulling the funis occasionally, is also a mode which is often successful. When these measures do not succeed, we must, as a last resource, prepare to introduce the hand, which should be previously warmed and anointed.

One finger after another must be insinuated into the vagina, until the whole hand, in a conical form, have passed the os externum; after which it is to be cautiously slid along the funis to the os uteri: the same caution is to be observed in advancing it into the womb. The proceeding is painful and sometimes resisted, but when the individual is informed that her life depends on it, she will submit with fortitude. Frequently the mere introduction of the hand into the uterus, without further interference, excites such powerful action of the organ, as speedily to dislodge both the placenta and the hand. At other times, however, to accomplish the object in view, it is necessary to make firm pressure on the mass itself, or upon the inner surface of the womb at different points, while a moderate degree of extracting force must at the same time be exerted on the cord. Another method which has often led to the separation of the secundines is, to encircle them with the fingers and press them toward the centre.

Should the foregoing measures fail in exciting the uterus to detach the mass, we have no alternative but to peel it off by the *cautious* insinuation of the fingers between it and the uterine parietes. And as the separation will occasion hæ-

morrhage to some extent, one of the female attendants must be employed at the time in making firm pressure by means of both hands extended over the uterus, to moderate the effusion.

A very important set of cases, requiring extreme caution in their management, are those in which the placenta, in consequence of diseased structure, has contracted too intimate a union with the uterus. The existence of such a state, before the hand is introduced, may be suspected by the presence of successive discharges of blood *per vaginam*. Independent of retention from portions of the mass having been converted into cartilage or bone, its detention may also be owing to some parts of it having become of a firm fleshy texture. As yet we are but indifferently informed regarding the causes of these conditions. I have seen the after-burden thus organized in primary as well as in after gestations; and it has been said, that such a state is apt to be repeated in the same female in her subsequent pregnancies. From attendant circumstances, I have been led to consider blows upon the abdomen, pressure exerted by the angles of a large fœtus, and the use of stays and corsets, by producing high irritation or actual inflammation, as causes of indurations and callosities in the placenta. When the hand is in utero, the cause of retention should be ascertained by the deliberate examination of the mass at all points; and as it is very rare to find the whole of it in a state of disease, or in firm connection with the womb, such portions as are of sound texture, or are actually detached, should be cautiously separated; in effecting which let the practitioner ever remember that both prudence and patience must regulate his proceedings; for such cases are attended with great responsibility, and have, under the most careful, deliberate, and judicious management, had a fatal termination. Where, in any case, it has been found necessary to peel off a placenta, all the portions that have been detached should be examined after their extraction, that a correct estimate may be formed of the proportion, if any, which may have been left behind. In some instances the diseased nucleus does not equal the circumference of a half-crown piece. We are not to underrate the power of the uterus itself, in effecting the detachment of a diseased and firmly adherent placenta. Some years ago, I was concerned in a case in which the natural contraction alone succeeded in separating the mass, in less than two hours after parturition, though it was extensively interspersed with osseous spicula, and nuclei of remarkably firm texture. In these cases the retained mass may be disposed of, *first*, by being sooner or later separated by the contractions of the uterus,

before decomposition has commenced; *secondly*, it may be expelled in a very putrid condition, and be followed by irritative fever, which is highly dangerous; *thirdly*, it may be absorbed, as no traces of it, in some instances, have ever appeared. If any part of the placenta, no consequence how extensive, be discovered very firm in its texture, and equally so in its union with the uterus, no attempt is to be made to scrape it away, or to peel it off; it is safer to leave it behind, and suffer its detachment to be effected by a natural process, which will generally happen in from two to four days. The indurated portion sloughs off; and while this is going on, from six to eight ounces of a saturated solution of the sulphate of alumen, in a tepid state, should be injected into the womb once in six hours, by means of an enema syringe, or a common bladder, mounted with a gum tube, sufficiently long to pass into the organ. This practice will answer the triple object of keeping the passages clean, preventing or moderating hæmorrhage, as also putrefaction of the morbid mass, which will be tanned by the astringent properties of the solution, and shortly thereafter drop into the vagina. During this period, the patient must be assiduously watched; moderate pressure applied to the region of the uterus, through the medium of the common binder, with a thick compress interposed; mild bland nourishment allowed; and if the uterine effusion be profuse, simple cordials. If the stomach continue free from irritability, occasional doses of camphor or ergot should be administered. In several obstinate cases in my own practice, this plan was eminently successful, though in one of them, the placenta had been retained for three days and a half.

The late Dr Young, Professor of Midwifery in the University of Edinburgh, and the predecessor of Dr Alex. Hamilton, states in his lectures, on the management of the placenta, that a woman would suffer less from a portion of adherent placenta being left in her uterus, than from its forcible detachment, and that he would rather leave it to nature than employ harsh measures for its removal. Moreover, he relates a case where the mass could not be brought away, and that no fœtid matters nor any thing like a placenta had ever made its appearance. Professor Nægele published in 1828,* three cases in which, after a premature delivery, neither the placenta nor membranes had ever been seen; and Professor Salomon of Leyden is said to have met with a similar instance,† whence it has been inferred, that the mass may be

* Med. Gaz. vol. iii. p. 189. † Med. Gaz. vol. xiv. p. 334.

removed by the absorbents of the uterus; in support of which opinion Dr Villeneuve* adduces many facts, as also to prove that cases of total adhesion of the mass are rarely, if ever fatal. Dr Ramsbotham† also relates an interesting instance in which the placenta had never been seen. Some years ago, I perused in MS., the lecture of Professor Young, on the Management of the Placenta, with no little astonishment, and conceived, until I was written to on the subject by Professor Nægelè, that Dr Young had either fallen into some error, or that he had been imposed upon; and the rather, as no case of this nature had ever occurred, or been previously related, to me. But although from the facts adduced, it would now be rash to deny, that a diseased and firmly adherent placenta may be left in utero with impunity, yet I would most earnestly dissuade a practitioner from overlooking, where he is compelled to leave the mass behind, the plan of treatment which I have recommended in such cases.

As to hour-glass contraction, the third cause of retention which has been described by systematic writers, I ventured in the last edition of this work to call in question the existence of such a state, or in other words, contraction of the circular fibres of the body of the uterus. It is now more than twenty years since I have had cause to doubt its occurrence, from having, a few years after I became a public teacher in this city, been often called to give assistance in cases which were considered as instances of hour-glass contraction, but which neither agreed with the descriptions I had heard in lectures, nor with those written in books; and up to the present moment, though I am still studying midwifery with some degree of industry, and practising the art upon a pretty extensive scale, I know nothing of such cases except from the conversation of my brethren who are young in practice, or those who feel no interest in the subject. I think I have long since discovered that condition of the uterus, which has often, if not almost always, been so denominated. As some time is suffered to elapse after the expulsion of the fœtus, before any attempt is made to remove the placenta, except when it is in the vagina, the os and cervix uteri will have contracted to such an extent, that they could not, without some degree of distension, receive the hand of the practitioner, who, on meeting with this obstruction, immediately declares the case to be one of hour-glass contraction. There is yet another obstacle which I think it very possible for the novice to have considered in the same light; and

* Library of Medicine, vol. vi. p. 227. † Obstet. Med. and Surgery, p. 514.

this is, where the hand is introduced into the pelvic cavity, but cannot be advanced farther, because the tyro has forgot, that to proceed, it should now be inclined toward the pubes, to pass through the brim.

The occurrence of hour-glass contraction has been considered very rare, or indeed denied, even so long ago as the time of Levrèt and Baudelocque. From the writings of the latter it may be inferred, that it was his opinion, the stricture was formed, not in the body, but in the cervix of the organ: he moreover, states, that he never met with a case of hour-glass contraction, that other practitioners whose field of observation was equally extensive, had not been concerned in such cases, and that only one instance had come to the knowledge of Levrèt.* Dr Douglas of Dublin, believes the stricture to be in the upper part of the cervix ;† Dr Rigby, that its seat varies from the upper part of the cervix to the os uteri ;‡ while Dr Ramsbotham says, he is almost persuaded that the os uteri has been considered as the constriction of the central fibres of the body.§ These cases, it is generally believed, arise from the fœtus having been advanced too rapidly through the passages, and from premature attempts having been made to remove the placenta by pulling or jerking the funis. It is universally admitted, and indeed corresponds with the result of my own experience, that hæmorrhage is not so apt to occur in cases of this nature as in those in which the mass is retained from torpor of the uterus; which indeed was to be expected when we consider how actively the organ contracts. In regard to the management under circumstances of retention similar to those now considered, although I have frequently been concerned in cases of most active contraction of the uterus, and consequent difficulty of removing the mass, yet I have never failed, except in premature deliveries, in effecting the object in view, simply by the patient and successive introduction of the fingers through the stricture, without the exhibition of any remedy whatever. The abstraction of blood has been recommended, and even practised for subduing the constriction; but lest hæmorrhage might supervene in endeavouring to effect the removal of the mass, I would certainly give the preference to a dose of from 60 to 100 drops of the tincture of opium. No time can be stated, when, after the expulsion of the fœtus, it can be said, that we should proceed to extract the placenta. I

* Translat. of Baudelocque, by Heath, vol. ii. p. 30, 31.
† Transac. Roy. Coll. of Phys., vol. vi. p. 393.
‡ Library of Medicine, vol. vi. p. 224.
§ Obstet. Med. and Surgery, p. 524.

would recommend the attempt to be made certainly within an hour, as we are then generally successful. Should, however, much resistance be experienced, owing to the active condition of the uterus, and that there be no symptom to excite apprehension, we may safely and advantageously abstain from interference for a longer period; but not a moment should hæmorrhage arise, which will facilitate our proceedings.

The most frequent, but fortunately the least formidable cause of retention, is from the lower part of the cervix uteri and the vagina contracting upon the mass, from its having been permitted to remain too long in the passage. Such cases occur only to those of our brethren who have just entered upon practice, or to individuals who are deficient in confidence, and who consequently fail to exert the necessary degree of traction on the funis, owing to the patient complaining of being injured by their proceedings. This variety of retention is recognised by the mass being felt in the vagina, while much resistance is experienced in attempting its removal. Its extraction, however, is readily effected by the introduction into the vagina, of a finger, which should penetrate the substance of the mass, and be used upon the principle of a hook, while the necessary degree of traction is to be exerted through the medium of the funis.

CHAPTER III.

LABORIOUS LABOURS.

In this class, I intend to include all cases of head presentations, in which the sufferings of the patient have been aggravated, not only by the protracted duration of the process, but by the means required to effect the separation of the infant from the parent. A further division of this subject into orders, may be conveniently adopted for practical purposes, according to the mode of management required in individual cases. To one order may be referred all those labours of a longer duration than twenty-four hours, but which have been terminated by the unaided efforts of the parent. In a second, may be included cases requiring instrumental assistance; but in which such mechanical powers may be resorted to, as shall not endanger the life of the mother or child. And in a third order may be comprehended those unfortunate examples which cannot be brought to a conclusion without subjecting the mother to dangerous operations; or, with a view to the preservation of her life, destroying that of the fœtus.

Although it must be very desirable to all parties to be made acquainted with the manner in which any case may terminate, yet, as this depends upon circumstances which are both numerous and various, and some of which also are unfolded in the progress of labour only, it is impossible for a practitioner, on many occasions, to give a decided opinion, even although he may have formerly attended the patient. A woman generally suffers more in her first than second confinement; but this even does not always hold good, and sometimes the very reverse is observed. Much depends on the volume of the fœtus, which is not the same in every pregnancy; and hence the reason why greater sufferings attend the birth of a male than that of a female child, the former being larger than the latter. No man, however great his experience may have been, can determine, in the living subject, with near precision, the dimensions of the fœtal cranium, or of the maternal pelvis. Disproportions in size betwixt these two, so trifling in degree as not to be recognizable to a practitioner of the most acute and scientific tact, may exert a material influence on the duration of labour, and thus greatly aggravate the sufferings of the patient. From what has been stated in speaking of natural labour, it would be remarked, that malpositions of the fœtal head may render labour very protracted and extremely painful.

There are a variety of conditions more immediately connected with the parent, which may contribute to bring a case under the present head. The state of a woman's mind, though certainly not an obvious, yet is a very frequent and a most annoying cause of protraction. The sufferings of a female will vary somewhat, as she may be firm or relaxed, and corpulent or of spare habit of body. When she is corpulent, or of rigid fibre, the transit of the fœtus is resisted; *first*, by the unyielding condition of the parts; *secondly*, by the pelvis being somewhat diminished in its capacity, from the increased deposition of matter on its inner surface; and, *thirdly*, we may be allowed to infer, when there is a superabundance of adipose matter, that the propelling agents are incapable of acting with their accustomed energy. An individual may suffer little in her first and second labour; but thereafter, and probably without any suspicion, a tumour, hard or soft, may be developed within the pelvis, or the coccyx may be anchylosed, and in her next confinement she suffers severely. The practitioner must not permit himself to be influenced in his decision, either by external marks of deformity, or by the general health of the patient. For, females who are of perfect symmetry, as far as regards general

appearance, are occasionally found with so contracted a pelvis, as to afford no chance of its admitting the transit of a fœtus at such a period of gestation as might present a prospect of its being reared. The function of parturition would seem, on some occasions at least, to be little influenced by impaired general health, or constitutional weakness; the debility is more frequently mental than corporeal, and of this phthisis may be mentioned as a most apposite illustration. Here, although there is great constitutional weakness, yet, when labour supervenes, it is speedily terminated, because there is relaxed fibre, and the mind is generally strong, or full of hope to the last.

Some discrimination is required to know, when a labour should, or should not, be referred to this class. Were pains, after some progress had been made, to be suspended, and the period of suspension considered as part of the time which the labour had continued, this would, in all probability, in many instances, cause it to be viewed, but improperly, as one of the present class; or, by considering it as such, it might be rendered so by unnecessary interference. Wherefore, neither the period of temporary action, nor that of suspension, must be added to the actual time which labour continued after its *recommencement*. For, if the head be in utero, and above the brim when uterine action ceases; or if the cranium be advanced somewhat into the pelvis even, but surrounded by the membranes and liquor amnii, the pressure on the structures of the mother cannot be greater or more injurious than it was previous to the temporary action of the uterus; wherefore, there would be no cause for interference.

The case, however, is very different where the pains of labour continue until the first stage is completed, or the second considerably advanced, and then cease; for, *here* the linings of the pelvis must be exposed to pressure, in which state the patient requires to be closely watched, for interference is often required. There is also a very material difference in those labours in which contractions recur for a longer space of time than twenty-four hours, except during the usual intermissions betwixt the pains; for these are strictly laborious, and constitute, with those last particularized, cases properly belonging to this class.

As we cannot often determine how a case may terminate, neither can we, in some instances, at first say, unless there be great deformity of the pelvis, to which of the three orders specified, a protracted labour must be referred. In her first confinement, a woman may have required artificial assistance, or even the destruction of the fœtus for her relief; but

in her following labour, the child may be born with such expedition that a practitioner has not time to be in attendance to afford the patient the necessary assistance.

When the medical attendant is called to any case, where he is informed the labour has continued for a longer space of time than twenty-four hours, there are several points for strict investigation. *First*, the nature of the woman's former labours if she has borne children; *secondly*, her general state of health at the time; *thirdly*, the period this function has in reality continued; *fourthly*, the actual stage of the process; *fifthly*, the energy of the propelling agents; and *lastly*, the condition of the pelvic linings. *First*, if it be a primary labour, we are carefully to observe, whether during a pain, the head of the fœtus be at all moved, or advanced though ever so slightly, when the prospects may be considered in favour of the process being ultimately terminated by the efforts of the parent alone; but it may be protracted for such a period, as to require that it should be removed from the class of natural, and placed under the first order of laborious labour. To prevent a practitioner, whose opportunities have not been sufficient to inspire confidence, imbibing any unfavourable ideas regarding the event of the labour, and unnecessarily requesting additional advice, it is of the first moment for him to remember, that in a first case especially, the progress of many hours during the second stage, is occasionally so remarkably slow or imperceptible, that it is difficult to determine whether the head be making the slightest advance; yet that under these discouraging circumstances, the unaided efforts of the patient frequently bring the process to a favourable conclusion. When labour is protracted in an individual who has formerly given birth to living children, we may, provided no unusual cause of obstruction be discovered, conclude that she is to be equally fortunate in this delivery, though from the length of time the pains have continued, it may be necessary to refer the case to the first order, or even to the second.

Secondly, when the health is good, labour may, under judicious management, be protracted for more than two days, without any detriment to the structures of the patient, and be brought to a successful termination at last, without the aid of any mechanical power; the case thus constituting one of the first order of the present class. I must here, however, express my conviction, that when there is sufficient space for the introduction of a mechanical power, calculated to assist the parent without producing lesion of structure, either in her or in the fœtus, we are not, *as a general rule*,

justified in withholding the application of such an adjuvant, after the labour has continued for thirty hours, and the passages are prepared. A woman in a delicate state of health is at all times to be carefully watched, and the case referred to the second order, when it shall at any period appear that her strength is not equal to the exertions which are required of her. At the same time it is important to recollect, that except in first labours, constitutional debility is rarely a cause for referring a case to any of the orders of this class. Though the patient be weakly, yet if there be no other unpleasant symptom than mere debility, by supporting her spirits, promoting ventilation, and giving a little mild nourishment and simple cordials, an attempt is still justifiable, to confine the case to the first order.

Thirdly, a practitioner is not to suffer himself to be influenced in his conduct, by the report of the attending matrons or patient, regarding the time labour has continued, but to ascertain the fact as nearly as he can himself, by a careful investigation into all the circumstances of the case. The female attendants often delight to exaggerate the sufferings of the woman; and as to midwives, not one in twenty of them, in this country at least, can distinguish the os uteri, even after they have been years in practice; and hence, when we are called to a case which has been protracted, we are sometimes informed that the patient has been in labour for a week or longer; but we may depend upon it, that no woman could support so great a protraction of her sufferings, without sinking under them.

Fourthly, as to the actual advance of parturition, if we find the process in the first stage, we know that however long contractions may have been present, there is nothing to be apprehended from lesion of structure, but the uterus may be exhausted. When from the irregular recurrence, or actual inefficiency of the labour pains, we have any reason to apprehend exhausted irritability of the womb, the best practice is, to suspend its action by a large opiate; and thus afford time for the vigour of the system in general to be recruited; and in all probability the pains will thereafter be renewed with greater regularity and effect, and the delivery will thus constitute one of the first order. But if we find a case in the second stage, that has already been long protracted, and which cannot be advanced by the means applicable to this stage in natural labour, it is to be carefully watched and referred to the second order, the instant symptoms indicative of injurious pressure, by the head upon the structures within the pelvis, begin to be evinced.

Fifthly, if the pains be regular, but feeble, and not advancing the delivery, they are to be excited, if the strength of the patient be good, but if the energy of the system, or of the propelling organs in particular, be also diminished, the most judicious practice will be to suspend uterine action altogether, in whatever stage the process may be found, but always with the proviso that the woman has no unfavourable symptom.

Lastly, in regard to the condition of the passages, if, in a case in which pains have long continued, we find the linings of the pelvis free from unusual tenderness and tumefaction, and the patient free from vascular excitement, even though the head be in the pelvis, we may still delay if the woman have strength, and refer the case to the first order. If, on the contrary, there are symptoms of injurious pressure, such as much pain on examination,. tumefaction of the parts which line the pelvis, with febrile pulse and frequent inclination to void urine, the case no longer belongs to the first, but must be removed to the second, or sometimes even to the third order. When the swelling of the soft parts is such, that the finger cannot with tolerable ease be passed round the head, the patient, if she have strength, should first be bled; and if no benefit, after a reasonable delay, be *distinctly* marked to accrue from this remedy, it may sooner or later be necessary to refer the case to the third order; for instruments calculated to bring the fœtus alive through the passages are not applicable, lest we might lacerate the organs of the parent, whose life we are not to risk, for that of the infant.

After due attention to the points which have now been considered, a practitioner should be able to determine to what order a case ought to be referred. And the friends, who naturally are all anxiety to know our opinion, should be candidly informed of the actual situation of the patient. In discharging this duty, proper respect must always be observed toward the individual in prior attendance, if there should have been any, in case he may have offered an opinion which cannot be supported by the facts of the case. When practitioners entertain opposite views, they should explain themselves to each other in private, and not in the presence of the attendants. And it is scarcely necessary to remark, that one gentleman should always treat another as such; for unless a man's conduct be conformable to his station in life, he will never be respected for his profession merely. By exposing the faults of those who may have preceded us, we may please the illiberal and uncharitable, gain a patient by

disingenuous means, and acquire temporary reputation among those ranks in society who are unacquainted with that behaviour which persons of respectable calling should observe towards each other; but among the more liberal and better informed part of the community, such conduct cannot fail to be viewed in its proper light, and sooner or later entail lasting disgrace on its authors. It becomes the medical attendant, in a case which is at all doubtful, to express himself in a guarded style to the friends, lest the result should prove different from what had been prognosticated. If the labour present no untoward feature, we may pronounce the patient to be free from danger; but we are to observe, that we cannot say at what time the delivery may be accomplished, or that there will be even a living child. When we are asked whether the fœtus be alive, a question which naturally suggests itself in a protracted case, a direct reply is to be evaded by stating, that after a certain period of labour we cannot determine this point.

Order I.

The causes which require cases to be referred to this order are numerous, and they may be referred to two heads; *first*, diminished energy of the organs concerned in the expulsion of the fœtus; and, *secondly*, obstacles opposing its transit. Some of these, again, are referable to the parent, others to the ovum or fœtus. Under the *first* head, debility, both local and general, and over-distension of the uterus, may be enumerated. The causes ranked under the *second* head are very numerous, as, over-distension and hernia of, and calculus in the urinary bladder; retroversion of the uterus, and occlusion, rigidity, and obliquity of the os uteri; enlargement and descent of the ovaries; tumours growing from any of the structures within the pelvis; accumulation of indurated fæcal matter in the rectum; trivial contraction of the passages; pendulous abdomen; rigidity of the external orifice; and cohesion of the labia. The causes which are referable to the ovum and fœtus are, rigidity of the membranes of the former; increased volume of the latter; an incompressible state of the bones of the cranium, from premature ossification; enlargement of it from disease; malpositions of it; and shortness of the umbilical cord.

Retarded delivery gives rise to disturbance of the most important functions. The patient presents an anxious despondent aspect, entertains the most gloomy ideas regarding her situation, and actual delirium ultimately follows. The heart,

though rarely affected under ordinary circumstances during labour, becomes much disturbed when the process is protracted; there is urgent thirst, and the skin is much excited. At last the stomach rejects every thing. The uterus becomes irregular in its action, the contractions ceasing entirely for half an hour or longer, and the sufferer sleeping during the interval without feeling refreshed. There is headache, restlessness, frequent inclination to void urine; contraction of the vagina from interrupted circulation, and extreme sensibility of the passage. Lesion of structure ultimately follows, and the result is too often fatal. Sloughing of the pelvic linings, and rupture of the uterus, would, I apprehend, much more frequently account for the misfortunes of females who die in child-bed, than exhaustion, either local or general; but from the reverence of the living for departed relatives, whereby dissection, when greatly to be wished for, is often withheld, and the impenetrable veil which the mansions of the deceased throw over everything they receive, the true nature of such cases remains unknown. Although such be the result of mismanaged cases, or, more charitably speaking, those which, from unavoidable causes, have proved fatal, most females during parturition can suffer a great deal with impunity; and provided they receive proper attention, much time may elapse before any unfavourable symptoms supervene.

In the present improved state of the profession, we rarely hear of females dying undelivered; and except rupture of some considerable blood-vessel, I know of no other circumstance which, in a patient attended by a regularly educated practitioner, should at all tolerate such an accident, or protect the accoucheur from the severest reprobation. Whatever method, therefore, may be required to separate the infant from the parent on the approach of danger, it should forthwith be resorted to, even if, from all appearance, she is likely to sink soon after the proceeding; for individuals have been known to recover under the most untoward circumstances. Moreover, no one can predict what effects delivery may produce. Cases must have been witnessed, in which, to use a familiar phrase, the destruction of the patient from some formidable accident, stared the medical attendant in the face, or in which there was the most distressing anguish, the most violent vascular excitement, and the most fearful cerebral irritation; but in which, when the fœtus was removed, all these appalling phenomena rapidly disappeared.

Sect. I.—*Management of the causes referable to the Parent.*

In regard to the *general debility*, it has already been observed, that parturition is rarely protracted from this state as the result of disease. The debility, whether local or general, which most frequently diminishes the energy of the propelling organs, arises from mismanagement, as want of rest for many successive nights from spurious pains; forcing the patient to walk to and fro in her room with a view to excite uterine action, when it is disposed to become inefficient; suffering the first stage to be long protracted, and premature expulsive efforts. The *modus operandi* of some of these causes will be gleaned from what has already been set forth on the causes of protraction of the first stage of natural labour; and the manner in which the others act, is too obvious to require illustration. In respect to the practice, when debility, local or general, is the cause of protraction, and when the case is in the first stage, let the action of the uterus be suspended by a large opiate, and let some light nourishment and cordials be recommended, that corporeal and mental energy may be renovated. If the case be in the second stage, the practitioner must be unremitting in his attentions, soothing and conciliating in his language and deportment, and if circumstances be favourable, let ergot be administered; but if neither this nor the stimulus of hope will revive the prostrate energies, the case must be carefully watched, and it may ultimately be necessary to refer it to the second order.

In regard to the *depressing passions*, some observations have already, in speaking of the management of the second stage of natural labour, been made, but the subject will require some further illustration here. If labour be suspended during the first stage, from fear, the most rational practice is to suffer it to be renewed spontaneously; but if suspended from this cause in the second stage, ergot should be given, provided every thing be favourable. It is of great moment in cases of this nature, to be able to manage the attendants. Their wishes, in so far as they are not calculated to interfere with any rational plan which the situation of the patient may require, should be complied with. To allay their clamour, we may in some instances be obliged to administer some remedy as a placebo, or they may suggest something themselves, which, if they have confidence in it, although in itself perfectly inert, may nevertheless be most salutary in its effects. Sometimes a strong desire is manifested to give wine or spirits, and this even, when there are no unfavourable symptoms, may to a certain extent be conceded. Oc-

casionally, they insist on some additional medical attendant; and this must be submitted to, more especially when matters are urgent, in order that the responsibility, in the event of any thing unpleasant happening, may be divided. In such a case, the practitioner should be regulated in his conduct by sound policy. If the selection be left to his discretion, a man eminent both for his talents and integrity should be recommended; but frequently his opinion is not asked, and the parties concerned, who certainly have a right, make choice of one, with whom, though for many reasons he might not feel inclined, yet must consult. In such a dilemma, the practitioner in prior attendance, rather than desert his patient, should call a second person, who, lest there should be a difference of opinion, shall act as umpire. Sometimes we are grossly insulted by a much younger, and far less experienced member of the profession being called; and here the senior practitioner must show, by submitting with good grace, that with years he has acquired gentlemanly forbearance, as well as practical experience.

Over-distension of the uterus is a case of very rare occurrence. Such a state may arise either from the organ containing several fœtus, or a large quantity of liquor amnii. It is an interesting fact, however, and one which must frequently have been noticed by practitioners, that though the uterus be greatly distended by the presence of several fœtus, yet parturition under such circumstances is scarcely ever protracted; while over-distension in consequence of preternatural quantity of liquor amnii, most certainly retards the progress of the first stage, from the uterine fibres being over distended. I have seen four cases of this nature: in the first the accumulation was so great that both the bed and the apartment of the patient were inundated; the child was very delicate, and died almost immediately after birth; the mother was spare, but apparently healthy. In this instance the amnion was incrassated at different points, and distinctly vascular. The second and third cases occurred in the same patient, who had for several years been subject to chronic hepatitis, and died on the eighth day after her last delivery. On both occasions the fœtus was diseased and premature: the first was born in the ninth month and died the third day after birth, and the second was in the eighth month, stillborn, and dropsical. The amnion in these two cases presented evidences of inflammation quite as unequivocal as in the first instance. The accumulation in the fourth delivery, must have amounted to a gallon at least; fœtus large, in the eighth month; died immediately after birth, affected with peritoni-

tis; no disease of the involucra; father and mother healthy. The presence of over-accumulation of liquor amnii may be suspected by the patient's size having increased rapidly, distressing dyspnœa, unusual tension of, and fluctuation in, the abdomen, indistinct fœtal movement, and œdema of the ankles and feet; and on examination per vaginam, the presenting part being indistinctly felt, and bounding with facility from the finger. To relieve the dyspnœa, and expedite the delivery, the membranes should be ruptured either by the fingers, a catheter with a stilette, or any other eligible contrivance, introduced through the os uteri.

Preternatural distension of the vesica urinaria rarely interferes with the transit of the fœtus, from the constant desire during the early stages of labour to void the urine, and from the free discharge by the skin. When it is present, the descent of the fœtus may be impeded either in a direct, or in an indirect manner; directly, by the distended bladder occupying a part of the brim of the pelvis; and indirectly, by the woman, during a contraction, restraining instead of exerting her powers, to avoid the sufferings of which the abdominal muscles, by their contraction on the bladder, are productive. For the mode of proceeding in such cases, labours complicated with distension of the urinary bladder in the fourth class, are to be consulted.

There are *other conditions of the bladder* by which the process may be retarded. This organ may protrude towards the side of the vagina, or into the centre of the pelvic cavity, and by thus occupying a part of the passage, it impedes the descent of the head. The occurrence of such a condition has been denied; but the circumstance related by Dr Merriman, of a perforator having been pushed into the bladder, upon the supposition of its being a hydrocephalic head, is too painful a proof that such a state does happen. A protrusion of the vesica must be distinguished from one of the membranes of the ovum, lest serious injury might be done to the patient by confounding the one with the other. In a descent of the bladder, the pressure of the fingers will produce pain and an inclination to void the urine, which can only be passed *guttatim;* and we cannot describe the circumference of the protrusion, from its connection to the pubes. The catheter should be used whenever this state is discovered, both to prevent the delivery being retarded, and injury been done to the distended organ.

The bladder may contain a calculus so large as to obstruct the descent of the head. When the presence of such an obstacle has been ascertained, an attempt must be made to push

the stone beyond the brim; but if the cranium has become impacted prior to this discovery, it may be necessary, *after prudent delay*, to refer the case to the third order. For, however painful it may seem, the destruction of the fœtus must be preferred to risking the life of the parent at this interesting period, by a formidable operation.

Malposition of the uterus, the result of previous *retroversion*, where the complete reposition of the organ had either not been accomplished, or not attempted, may be a cause of protracted delivery. The os uteri in such cases will be discovered in the vicinity of the pubes. A finger must be insinuated into the aperture, which is gradually to be brought down into the pelvic cavity; and so retained until the position of the uterus be changed, and a proper direction secured for the presenting part. Further information on this head will be obtained in the article *Retroversion*, among the Diseases of Pregnancy.

Obliteration of the uterine aperture from inflammation and consecutive agglutination of its margins, during pregnancy, protracts the first stage. Many cases are related where no os uteri could be traced for some time after the commencement of labour. I met with one instance in 1820, and with another in 1824. Both were first pregnancies. In the former, uterine action continued about twelve hours before the os uteri could be distinguished, when it felt like a minute cicatrice. The *second* woman had regular pains for two nights and a day, before the os tincæ could be perceived; and she suffered so severely as to require three persons to keep her in bed. Both these patients were largely bled, gave birth to living children, and had a good recovery. As formidable operations have been performed in some of these cases, they will require a further illustration in the third order.

Rigidity of the os uteri is a condition of which some notice has already been taken. It is a frequent cause of protracted parturition in primary cases, more especially in those females who, at an advanced period of life, are in labour for the first time. Independently of that firmness of texture which is natural to the organ previous to child-bearing, its orifice may have become indurated in consequence of some morbid action, such as chronic inflammation, or scirrhus, either of which have been known to retard its dilatation, not only for many hours, but even for several days. Venesection has already been recommended under another head, in the lesser degrees of rigidity; and in the more obstinate examples, like those now under consideration, the bold use of the same remedy, in every instance in which the patient possesses suffi-

cient stamina, cannot be too strongly insisted on. When blood-letting, carried to such an extent as the strength of the sufferer will permit, has failed to produce relaxation of the aperture, the finger must be introduced within it to exert cautious pressure in a circular direction on its margin, during a contraction. Though I have never witnessed any unpleasant symptom ensue from this practice, yet as it occasions, at the moment, sensations extremely acute to the patient, I feel it my duty to protest against that unsparing application of it suggested by some of the profession, lest it render more obstinate in future labours, the conditions for which it is employed, or induce them when scarcely present. It requires no great stretch of imagination to suppose, that in a woman of an irritable habit, inflammation of the uterus might result, more especially during an epidemic season. As a surgical operation has occasionally been resorted to in these cases, they will require a further illustration in the third order.

Obliquity of the os uteri is a cause which, though it certainly procrastinates the process in a primary labour, yet rarely exerts much influence afterwards, except where the organ has continued in a state of retroversion. The practice required has already been stated in the management of natural labour, as also in the present order.

The partial occupation of the brim by an enlarged ovary, or of the pelvis and vagina by polypi or other tumours, hard or soft, growing from any of the structures in the pelvis, may cause the delivery to be protracted. But as the efforts of the parent, which should always have a fair and patient trial, are too frequently insufficient to accomplish the delivery, and as a surgical operation becomes necessary, such cases will require a further consideration in the third order. While we are watching the natural efforts, the sufferer must be bled to prevent injury to the pelvic structures from the long-continued pressure of the head.

Torpor of the bowels is often permitted, to an incredible extent, by the sex. I attended in labour a patient who assured me, that from the day she embarked on board a ship at Thurso, Caithness-shire, for North America—a voyage of twenty-nine days—nothing whatever passed through her bowels until she landed at Montreal,—a statement which some of her connexions corroborated, by informing me that occasionally they had known her to pass a fortnight, or even a longer period, without any alvine evacuation, and nevertheless enjoy excellent health. When the rectum is loaded, it occupies a considerable space in the brim and outlet, and

thus proves a mechanical obstruction to the descent of the head. As the condition of the intestine is easily ascertained during the ordinary examination, whenever it is discovered to be charged, its contents are to be dislodged by a succession of enemata. Since the canal may be burst under the pressure of the head, such a state demands attention also on this account.

Contraction of the passages may be referred to some condition of the soft parts, to original retarded development of the bones composing the pelvis, and to the mobility betwixt the coccyx and the sacrum being impaired or lost from anchylosis of the former to the latter. The calibre of the vagina at some point may be contracted, or its structure rendered more dense by a cicatrice from some previous lesion, whereby its dilatation may be retarded. Sometimes these obstructions are so unobvious, that they escape our tact in the commencement of labour; and they are only discovered, probably, when the case by its protraction excites greater interest, and gives rise to stricter exploration. Trivial contractions of the pelvic cavity, except from anchylosis of the coccyx, cannot, as already observed, be positively determined in the living subject, and we merely suspect the existence of such a state, where no actual deformity can be detected, by the presenting part being remarkably slow in its descent, though the pains be strong and the presentation natural; or by the bones of the head, when it presents, being felt to overlap. Sometimes after an individual has had an easy labour, a small callous deposition, about the thickness of the little finger, takes place on the inside of the symphysis pubis, and if the short diameter of the brim previously possessed but little more space than the ordinary dimensions, this recent formation would certainly retard the descent of the head. The medical attendant should be aware that in a large majority of cases, all the obstacles now particularized are overcome by patience and venesection. When a woman possesses stamina, blood-letting is highly beneficial in all first labours, and in every instance, indeed, where a long detention of the head in the pelvis has taken place. By whatever cause parturition may have been retarded, our examinations are not to be frequently repeated, lest we add to existing irritation. Primary labours of the description under consideration, often require to be referred to the third order.

The capacity of the pelvis may be diminished by general tumefaction of its linings, consequent on interrupted circulation, from a long detention of the child's head, or from frequent examination. This cause of protraction, of which the

symptoms have already been noticed, is one of no ordinary nature, since, unless the case be promptly and energetically attended to, the result may be calamitous from lesion of structure. Unless a practitioner has had the management of the patient from the commencement of labour, he is apt to view this variety of diminished capacity as arising from original defect in the development of the bones themselves. The happiest result will be derived, in cases of this nature, from venesection, carried to the extent the vigour of the patient will admit, and the urgency of the symptoms demand. As it rarely happens that this remedy cannot be resorted to, though frequently objected to by the patient and those around her, the medical attendant must be regulated by the condition of the pulse, and the sensations excited in the passages during examination. If, after blood-letting, there be sufficient space for the application of instruments calculated to extract the fœtus alive, the case must speedily be referred to the second, but if there is not sufficient room, to the third order.

Pendulous abdomen, from the bandage which is applied round the body after parturition being now as unexceptionably used, as it was at one period frequently neglected, is seldom met with. When present in any case, it may be ascribed to the neglect in question, the abdominal muscles, after having been distended by repeated gestations, not having regained their former contractibility. When such individuals are in a sedentary position, it may be observed, that the uterus, pushing the abdominal parietes before it, rests on the thighs. During parturition, when the woman lies on either side, the presenting part is thrown either to the right or left side of the brim of the pelvis, and when a pain supervenes, the head does not enter this opening, but strikes against some point of its margin. The practice is obvious; the patient should be requested to turn upon her back, and take some pains in that position, to aid in gaining a proper direction for the head. To assist in the same object, and to afford support to the abdominal muscles, a broad roller should be applied round the abdomen, and suffered to remain until the second stage is concluded.

Rigidity of the parts which close up the outlet, more frequently than any other cause, compels us to refer a case either to the first or second order of this class. Examples are occasionally met with, where the head has continued on the perinæum from twelve to twenty hours, or even longer. In females advanced in life, those who are corpulent, and such as are of a rigid fibre, when in labour for the first time, so

long a period is required, and so much severe suffering experienced, before the os externum can be dilated and the head expelled, as to be sufficient in some instances almost to subdue the corporeal and mental energy of the most vigorous and resolute of the sex. Nor is it unnecessary to repeat, that mismanagement or protraction of the first stage, and consequent diminished energy of the propelling agents, is not an unfrequent cause for the head remaining long on the perinæum. The attendants become clamorous and impatient, the sufferer utters the most discouraging complaints, so that the situation of a young medical attendant, unless he possesses sufficient confidence not to be unhinged by the scene before him, is far from enviable. In such cases, the continual attendance of the practitioner at the bed-side, and conciliatory and encouraging conduct by every one towards the patient, can accomplish a great deal. Some unctuous matter must frequently be applied to the parts, whether the flow from the vagina be copious or not. This is a practice which is so grateful to the woman, and so beneficial in its results, that I am at a loss to comprehend upon what principle any one can withhold its application. So long as the patient possesses sufficient stamina, blood-letting must also be conjoined. Cases protracted from this state, occasionally require to be referred to the second order.

Cohesion of the labia, and consequent obliteration of the os externum, may either be an original defect, or the work of art. The opening has sometimes continued so contracted from birth, as scarcely to admit a pencil case. In the female descendants of royalty in some of the nations of Africa, it is customary to stitch the labia at some period antecedently to the appearance of the catamenia, to prevent illicit intercourse. From whatever cause such a state of the external orifice has arisen, we may naturally conceive, that it must exert considerable influence on the duration of parturition. Many cases are recorded where the natural efforts accomplished the dilatation of the passage. Such examples require exactly the same management as those last considered; but as they occasionally demand a surgical operation, a further illustration of them will be necessary in the third order.

Sect. II.—*Management of the Causes referable to the Ovum and Fœtus.*

Whatever may be said to the contrary, the circumstance of an ovum being expelled entire, of the membranes supporting without being ruptured, pinching and rude traction by the fingers of the practitioner, are sufficient to prove that

rigidity of the membranes of the ovum may retard delivery. The practice to be pursued, has been already described under head of, Management in Natural Labour.

In regard to the various conditions of the fœtal head which have been particularized as leading to protraction of labour, such as, unusual size from overgrowth; premature ossification, and enlargement of it from disease; we cannot in the living subject positively determine to what extent the cranium, in reference to the capacity of the pelvis, is in excess; but we may presume it to be so, as also to be unusually ossified, when, though the parturient efforts be powerful, and the head in a natural position, but almost immobile during a pain, when its descent is very slow, when the bones do not slide over each other at the sutures, and when they cannot easily be indented by pressure of the fingers.

A head affected with hydrocephalus can be more readily distinguished. During a contraction, it feels exactly like the membranes of the ovum in a state of distension from uterine action; not a suture or bone can be traced; but when the uterus is quiescent, both can be distinguished, and subjacent to the cranial integuments, the bones feel as if floating in the contained fluid. In these cases, the first stage is generally though not invariably protracted; but the second is always so. They require our undivided attention, for, in consequence of the cranium being so closely embraced, injury to the ambient structures from pressure, may sooner or later arise. All causes tending to irritation, either of the body or mind, are to be avoided; with this view, frequent examinations must be abstained from; the urine and fæces regularly voided; the patient permitted to change her position from time to time; and granted any indulgence which will not prove detrimental to her situation. We also endeavour to economise her strength by the stimulus of hope, by renovating the atmosphere of the apartment, allowing some mild nourishment and cordials, and insisting on strict quiet being observed in her dwelling, that she may sleep if she may feel inclined. If the passages feel unusually warm and painful during examination, and the skin and pulse indicate excitement, venesection to a prudent extent should be premised. But if these unpleasant symptoms are not arrested by this practice, while the presenting part can scarcely be said to be advancing, the case may ultimately require to be referred to the third order; for it is not probable, that instruments calculated to extract the fœtus alive, were we certain of its being so, could be introduced, without risking contusion of the maternal structures.

In considering the definition of natural labour, an explanation has been offered of the manner in which malposition of the head may cause the process to be protracted; we must now trace the course which it pursues, and the practice which is required in such cases. The malpresentations most frequently met with, are those of the forehead to the right or left acetabulum; and of the anterior fontanelle, with the face turned towards either sacro-iliac symphysis. Besides the foregoing, several others have been particularized, which, however, are of rare occurrence; as the vertex to the pubes, or sacrum; the side of the face, of the occiput, and of the chin to either acetabulum, sacro-iliac symphysis, pubes, or sacrum. The causes which give rise to such presentations are still a matter of pure conjecture. They have been ascribed to irregular formation of the pelvis, but a satisfactory refutation of this hypothesis is, that a woman who has borne a large family, may have had but one presentation of this nature.

When the brow presents with the face directed towards either acetabulum, such labours are distinguished by the presenting part being very slow in its descent; its feeling smooth and flat; our being able to trace the anterior fontanelle as the cranium advances; and the particular direction of the sutures. As the head descends, the vertex progressively turns towards the sacrum, moves very slowly over the inclined plane of the coccyx and perinæum, and protrudes at the os externum, while the face rises behind the pubes: or, a second mode by which such cases may terminate is, by the chin slipping down from behind the symphysis into the arch of the pubes, while the vertex ascends towards the sacrum, till the face is born. The former of these is the more frequent mode of termination. In either way, the progress of the labour is so very slow, that we can scarcely distinguish the least advance in the presentation for many hours; which the novice in the art is inclined to ascribe, but improperly, to the inefficiency of the parturient efforts, and not to the true cause,—the unsuitable position of the head. The early attendance of the practitioner, if the nature of the case be discovered, which, however, is not easy, may save the patient much suffering. The membranes are immediately to be ruptured, one or two fingers insinuated between the cranium and the pubes, and the forehead, by steady pressure, pushed upwards and backwards, both during the presence and absence of pains, whereby the vertex will be forced to descend, and the face to turn towards the sacrum. If the head be well advanced into the pelvis, its position can rarely

be rectified with that ease which some writers pretend: to speak from my own experience, indeed, it can seldom be accomplished without such efforts and consequent contusion as might prove highly detrimental to the pelvic linings; so that if we are not early called, or find the presenting part very mobile, we are obliged to leave the delivery to nature, so long as she can be trusted. Such cases, owing to diminished energy of the propelling agents, are occasionally referred to the second order, where a further illustration of them will be offered.

Presentations of the anterior fontanelle, with the face to either sacro-iliac symphysis, are more frequent than the preceding. Such labours are distinguished by the fontanelle being early felt, and the head being somewhat tardy in its descent, in the commencement of the process. If the pelvis be sufficiently capacious, which can be determined by the degree of mobility possessed by the cranium, interference is unnecessary; but if the presenting part, on the contrary, has little motion during a contraction, or cannot in the absence of one be easily moved, steady pressure is to be made on the forehead, by the application of two fingers, during a pain, by which we cause the vertex to descend, and the head to become more oblique. Such cases are rarely protracted for such a period as to require being referred to this class.

Presentations of the vertex to the pubes, or to the sacrum, are exceedingly rare. If early discovered, and attended to before the cranium becomes fixed in the brim, they are easily rectified. The position is more readily altered when the vertex is at the pubes than the reverse. Upon the same principle that the head, during its descent in natural labour, is forced to accommodate itself to the widest diameters of the pelvis, it may be presumed that also in the presentations now under consideration, uterine action will cause the face to become more oblique in its position, by forcing it towards either sacro-iliac symphysis or acetabulum. When the face is directly toward the promontory of the sacrum, or at the symphysis pubis, the head, without some change in its position, cannot possibly, in a pelvis of regular formation, pass through the brim, since, from the occiput to the forehead measures nearly half an inch more than the space, in a direct line, from sacrum to pubes. When nature, however, after a fair trial, seems incapable of effecting the desired change, an attempt must be made to move the face to the nearest sacro-iliac symphysis. Such cases will require a further illustration in the second and third orders.

Presentations of the side of the face are as rarely met with

as the last. They are distinguished by the ear, and by their being remarkably tardy in the descent. If the part has been long exposed to pressure in the pelvis, it will be a matter of much difficulty to determine its nature, until the mouth or nose can be detected. The proper practice is, immediately to introduce the hand to rectify the position, before the head becomes wedged in the passage. The face must be made to ascend, to allow the posterior part of the head to come down.

Presentations of the occiput are sometimes met with. They are distinguished by the triangular shape of the bone, its proximity to the neck, and by the limbs of the lambdoidal suture. The edge of the psoas magnus slightly resists the descent of the forehead. Interference is rarely required in such labours. If they have been discovered, the only assistance necessary is, to push up the vertex during a contraction, which will cause a descent of the forehead. Such cases rarely require, either from the suffering of the patient, or the duration of the process, to be referred to this class.

Labours in which the *face presents*, with the *chin directed to either acetabulum, either sacro-iliac symphysis, pubes, or sacrum*, are not easily managed, and the difficulty increases in the order in which the presentations are mentioned. The sufferings of the patient in these cases are generally very acute and greatly protracted; for the face is almost incompressible, and presents so wide a surface that it is ill suited to traverse the passage, whence it requires in some measure to be moulded to the pelvis in its transit. Moreover, as it is evident that in such deliveries the head is thrown backward on the neck, it must occupy the pelvis to a much greater extent than when the face is inclined towards the chest, and hence another great obstacle to the speedy completion of this function. In the early stages, the case may be recognised by a careful examination; but this is extremely difficult after labour has continued some time, for the tumefaction produced by pressure renders the features indistinct, and the practitioner is apt to confound the part with the vertex or breech. If we are in attendance before the cranium has become wedged in the pelvis, the practice is to introduce the hand to rectify its position, by pressing the chin in a lateral direction upwards. By this step, the forehead may be brought down, and by a steady continuance of the pressure upon it, be ultimately exchanged for a presentation of the vertex. When the presentation, however, is far advanced, it is difficult to benefit the patient, and we are often obliged to leave matters to nature, so long as she can be trusted.

Unless the cranium be firmly embraced, we may still, by pressure upon the chin, rectify the position to a certain extent; or if this part be felt at, and has descended nearly to the pubic arch, it can be depressed by hooking the finger over it, and the expulsion of the head assisted, for the chin is the part which, generally, is first protruded. Frequently, the patient is so much exhausted, that it becomes necessary to refer labours of this nature to the second order, in which they will be further illustrated. The perinæum requires to be carefully supported, since, from the unsuitable position of the cranium, it is much distended, and very liable to be ruptured. When the fœtus is expelled in a case which has been left to nature, or in which we have failed to afford effectual assistance, all the features will be much distorted, the countenance swollen and livid, the head itself greatly elongated, and animation very torpid, or completely suspended. Sometimes, under judicious management even, the integuments on some point of the countenance, the cheek for example, may be lacerated.

Shortness of the funis is the last cause to be considered, and though confidently admitted by men who have become grey-haired in the art, yet I am by no means reconciled to it. If we simply bear in mind, that as the fœtus passes from the womb, this latter contracts in the same ratio, and thus as it were follows it, we may without much difficulty admit, that after the head is expelled, the umbilicus may still be in contact with the uterus; so that if the cord be from two to three inches in length, this will be sufficient to permit the uninterrupted passage of the cranium. The supposed condition of the funis might certainly exert some little influence in retarding the expulsion of the body. I have to learn, however, whether, in such a case, shortness of the cord ever led to inversion of the uterus, as might naturally be expected to happen, did the condition in question possess the alleged influence. Or if the contractions of the uterus were very powerful, and the placenta not very firmly adherent, either the mass would be detached, or the funis lacerated, as in a case referred to by Dr Rigby, in his very elaborate contribution to the Library of Medicine. In the instance alluded to, after two or three violent pains, the fœtus was expelled—the cord being ruptured about two inches from the umbilicus, at its very insertion into the placenta, as appeared on subsequent examination; so that it could not have exceeded two inches in length.* Cases frequently oc-

* Library of Medicine, vol. vi. p. 182.

cur in which the funis, though long, is so completely entwined round the neck and body of the fœtus, as to leave but a small portion of it disengaged. Such a state, I must certainly say, does not retard the delivery. I have heard some personages gravely assert, that when the cord is too short, this may be suspected, by the retraction of the fœtal head after every pain; but the truth is, that this happens in every case, whether the funis be long or short.

The exhibition of Opium has often been mentioned in this order, and as it is a medicine of great and unquestionable utility under many circumstances during parturition, though from its abuse occasionally brought into discredit, I think it necessary to state in conclusion, that during the second stage at least, it should not be prescribed without mature deliberation. As it is impossible beforehand to determine whether this drug may for a time suspend, or temporarily excite uterine action, it should not be exhibited in the second stage, unless the practitioner has had sufficient experience to discern whether the pelvis be of proper form and capacity, and its linings free from tenderness. For, were they otherwise, and if opium had led to the suspension of labour, the continued pressure of the head on the pelvic linings could not fail to add to the existing irritation, and be productive, perhaps, of painful results.

Order II.

Causes for referring Labours to this Order.

Some of the cases considered under the first, occasionally require to be removed to the second, or even to the third order. Diminished energy of the propelling agents is the principal cause for referring a labour to the present head; for when the obstacle is such as to offer much resistance to the transit of the child, or, in other words, reduce the capacity of any part of the pelvis so much, that the fœtal cranium would suffer considerable compression before it could pass, such a case would not constitute one of the second order, since, by such compression, the infant would be destroyed, and the structures of the parent injured. Besides cases which are protracted by debility, local or general, labours rendered tedious or laborious, by a trivial reduction in the capacity of the pelvis, and malposition of the head, must be further illustrated here. In this order, also, we must attentively consider, *first*, the history of the patient; *secondly*, her state of health; *thirdly*, the position of the fœtal head; *fourthly*, the progress or actual advance of the case; and, *fifthly*, the condition of the passages.

In regard to the previous history of the sufferer, if she has been accustomed to bear living children, there is every probability that we may be able to bring the case to a conclusion by artificial means, with safety to the mother and child, provided nothing has occurred subsequent to the previous confinement, to diminish the capacity of any part of the pelvis.

With reference to the health of the individual, if her strength be much reduced, no consequence from what cause, and more especially in a first labour, while the contractions of the uterus are diminished in power, or suspended, the case will require to be referred to the present order. For under such circumstances, the prospects of uterine action increasing in vigour, or being renewed, cannot be great; so that the patient will require to be attentively watched, and artificial aid resorted to on the slightest evidence of any unpleasant symptom.

If the position of the cranium be such, that it shall occupy a much larger space than if the presentation were strictly natural, while the action of the uterus is in a subdued state, and the delivery has been much protracted, it will require to be referred to this order.

As to the actual advance of labour, if the parietal protuberances, which form the most bulky part of the cranium, have passed through the brim, the case will constitute one of the second order, provided there be no deficiency of space at the outlet.

In regard to the condition of the passages, and of the pelvis in particular, it has already been remarked, that the delivery may be retarded by narrowness of this cavity, so extremely trivial on the whole, as to defy the nicest tact to determine whether either the want of room, or the size of the head be such, that the labour can neither be terminated by the natural efforts, nor by such artificial powers as shall prove harmless to the fœtus and parent. The only rule of conduct that can be prescribed for the guidance of the practitioner, in this painful state of uncertainty, is, to delay interference so long as prudence shall dictate, and to economise the powers of the patient by judicious management during parturition. He should be aware, however, from the preceding observations, that great danger both to mother and child may be induced by procrastination under the present circumstances. The cranium is progressively forced into the pelvis, until it can neither be farther advanced by the natural efforts, nor made to recede without much extraneous force. This is what has been improperly denominated *impacted head*, and of which so

many explanations have been offered by accoucheurs; I say improperly, since it is rarely so wedged in the pelvis as this term implies. But though moveable, it cannot long continue in this situation without impeding the venous and lymphatic circulations through the pelvis; which, with consequent tumefaction, inflammation, and sloughing of some important viscus, may reduce the patient to a loathsome condition, or be followed by fatal results. When, on the other hand, the fœtus has long been exposed to pressure, the integuments of the scalp gradually become tumefied, and consequently approach nearer the vulva, by which the young practitioner is led to think that the head is actually advancing, though it is in fact as stationary as before. By a continuance of the pressure, the cranium, from its bones overlapping, and being in some instances even fractured, is altered in shape; the texture of the brain is materially deranged; and this, with suspended circulation in the funis, also the effect of pressure, destroys the fœtus. It is scarcely necessary to state, that impacted head, except when detected early, can seldom be referred to the present order; since an attempt to elevate it in the pelvis, with a view to apply some mechanical power to accomplish its extraction, may, on the one hand, be attended with laceration of the uterus, and on the other, with contusion of the pelvic linings.

An unyielding condition of the external parts is another cause of arrest of the head in the second order. This state, however, is widely different from the last, and may be easily distinguished from it by the absence of tenderness of the parts, on examination; by the facility with which the finger can be insinuated betwixt the head and the parietes of the pelvis; by the mobility of the presenting part; and by the total absence of fever, with only that acceleration of the pulse produced by the efforts of the patient, and which the practitioner must distinguish from the phenomena characterising organic lesion.

No case can be referred to the second order, until the os uteri be fully dilated, or nearly so. And if the fœtus be at the full time, and of the ordinary size, we can neither accomplish its extraction successfully by mechanical invention, nor can we expect that the expulsion will be effected by the natural efforts, unless there be a clear space of three inches and one half between sacrum and pubes, and the same betwixt the tuberosities of the *ischia*. This statement, I am aware, is at variance with the sentiments of some veteran practitioners, who think that they have themselves succeeded in extracting living infants, by a mechanical power immedi-

ately to be considered, through pelves of only three inches short diameter at the *brim*. I am, in the *first* place, at a loss to comprehend how those gentlemen could determine with such admirable precision, in the living subject, the dimensions of the pelves on which they were operating. And in the *second*, how we are to reconcile those miracles with the experiments of the distinguished Baudelocque, who could not in any one fœtus of a number experimented on, compress the head in its parietal diameter, by forceps, to a greater extent than from three to four lines, without rendering the instrument straight in the attempt, bursting the integuments, and squeezing out a portion of the cerebrum by the effort.

As it is probable, from the foregoing experiments, that the head cannot safely be compressed to a greater extent than three lines; and as the reduction thus obtained, or one fully equal to it, will be required for the accommodation of the extracting instrument, it is an obvious inference, if it be admitted that the transverse diameter of the head measures, in the generality of cases, about three inches and a half, that the fœtus cannot be expelled by the efforts of nature, or extracted by the assistance of art, with any prospects of preserving its life, unless we have a commensurate aperture at the brim and outlet. As the bones of the cranium are in different degrees of pliancy in different infants, and the fœtus at birth various in its size, the circumstances of a labour having been brought to a successful termination, when it was thought the short diameter of the brim and outlet did not exceed three inches, may be accounted for, by supposing that the labour was premature, or the fœtus dwarfish in its development.

Sect. I.—*History and Application of the Fillet.*

Several inventions of remote origin, modified as required by the improvements which have, at different periods, been introduced into practice, have been recommended as calculated to terminate the process of parturition with safety to the mother and child, where the natural powers seemed inadequate. These expedients are the Fillet, Forceps, and Lever. The first of these is of as ancient a date as the time of Hippocrates; and it has since enjoyed considerable reputation with different individuals. It has been composed of a variety of materials, as silk, cotton, worsted, and leather; and, with a view to render it more commodious for application, or increase its power, cane, whalebone, or iron-wire, has been added. From the pliability of the materials of

which it was formed, it was thought that it might be applied with greater ease and safety to the structures of the fœtus, than instruments made of hard materials. The operator was directed to form a noose on the fillet, and fix this afterwards by the finger, or some other contrivance, on the chin, or place it around the neck of the child; after which, both ends were twisted together to give it strength, and render it more commodious for conducting the extraction, which was to be attempted with all the power the instrument could support, or the character of the case might require. Practice, however, soon demonstrated, not only that the fillet could not be applied without considerable difficulty, but that it easily slipped off, except when placed on the neck; and moreover, that it could neither be used so effectually, nor so safely, as contrivances made of firmer materials. When the fillet is fixed, it does not enable the operator to act with it in such a manner that the fœtus shall make the proper turns in the pelvis: traction can only be exerted in one direction. Upon whatever part it is fixed, it must draw that down first, and probably render a bad case worse; as could not fail to happen were it placed on the neck, which would be brought into the brim, whereby the head would be doubled upon the shoulder. And that the necessary force cannot with safety be exerted, is too clearly shown by the horrid case published by Dr Merriman, in which the operator brought away one of the vertebræ of the neck, in the noose of the fillet, and thus decapitated the fœtus. This invention has long ceased to be employed in practice, and scarcely deserves this brief notice.

Sect. II.—*History and Application of the Forceps.*

In point of antiquity, the forceps stands next to the preceding contrivance; for the father of medicine mentions it, though its characters are not described. Avicenna of the 10th, and Albucasis of the 11th century, must also have been accustomed to use forceps; and though the latter offers a representation of this instrument, furnished with teeth, from which it might be inferred that the preservation of the fœtus was not contemplated, yet two sorts of them are spoken of by these writers; the one to be used when the child was dead, the other when it was living. Though this certainly was an approach to an era in the operative department of midwifery, yet we have no data to prove that any attempts had been made before the commencement of the 17th century, to invent an instrument clearly with a view to preserve

the life of the fœtus. The Germans have claimed for Rueffe, an author of the latter half of the 16th century, this merit, but unjustly, as may be seen by consulting the 9th vol. Med.-Chir. Transac. Lond., wherein it is distinctly proved, that if so important an invention had been promulgated by Rueffe, no practical demonstration had been afforded of its utility for more than half a century afterwards, when Dr Chamberlen invented a mechanical power, consisting of two blades, capable of being separately introduced into the pelvis, and of being afterwards united in such a manner, that the one formed a fulcrum for the other, without involving the structures of the parent. In his preface to the translation of Mauriceau's Treatise, which he published 1672, Dr Chamberlen states that his father, himself, and his brother, were in possession of an invention, which, without destroying the fœtus, enabled them to deliver females who had a contracted pelvis. As we are informed that the secret was confined to this family for eighty years, it is probable that they were their own artificers, a conclusion which is not a little strengthened by the barbarous aspect of such representations of the Chamberlen Forceps as are now exhibited in the lecture-rooms. Such was the notoriety which these people had acquired in this department, by the application of an instrument, which, from its form and dimensions, could never have been used except in females endowed with extraordinary capacity of the pelvis, and not in the description of cases pretended by its authors, that one of the family, emboldened by the flattery of his countrymen, or encouraged by the over-ruling passions of gain or ambition, repaired to Paris, where he over-hastily asserted that he could accomplish delivery, with safety to the mother and child, in a case which was deemed by Mauriceau to require the Cæsarean section. The attempt was made, but it completely failed, and the patient eventually fell a victim to it, which procured for the operator so ungracious a reception, that he soon quitted the French capital, without having improved either his reputation or his fortune.

In returning to his own country, he passed through Holland, where it is supposed that he communicated the cause of his precipitate departure from Paris to Roger Roonhuysen of Amsterdam, who, from the ideas which he conceived of Chamberlen's arcanum, invented an instrument of his own which went long under his name, and gained him as much celebrity in Holland, as the forceps had done for its possessors in England. After the decease of its inventor, it became the property of Ruysch, and after him that of Vischer

and Van de Poll, who, in 1753, generously offered a public description of it in the Dutch language; and the following year was translated into French by M. Preville.

It was natural to suppose that an agent which had by this time conferred such extraordinary advantages on its possessor could not remain much longer a secret; and accordingly the forceps soon became an object of such general attention among practitioners of midwifery and others, that both in this country and on the continent, several members of the profession procured contrivances, which they were accustomed to use upon this principle. To Palfyn of Ghent the merit is due of having been the first who furnished the public with a printed account of his forceps, which appeared in 1722. Dr Hody, in 1733, published Giffard's cases, with a description of his instrument, which was a *fac simile* of that used by Chapman, and also by Drinkwater of Brentford, who was contemporary with one of the Chamberlens, and practised the obstetric art during the latter half of the seventeenth, and early part of the eighteenth century. The contrivances of those times were coarsely manufactured, and but indifferently calculated to accomplish the object for which they had been invented; but as females were now becoming more alive to their own interest, by preferring properly educated male practitioners to individuals of their own sex, better opportunities were thus afforded of studying and supplying the deficiencies of the art. Dr Smellie of this country was one of those who conferred lasting obligations on this branch, by the improvements which he effected in various subjects connected with it. In particular, he rendered the forceps less terrific in appearance, shorter, lighter, and in every respect better calculated to accomplish the important object which its original inventor had contemplated. About the same time, obligations equally weighty were conferred on the profession by the distinguished Levrèt of Paris, to whom we are indebted for one of the most obvious improvements in this expedient. Instead of a single curve, as in the original invention, he directed the margins of the blades to be also curved; so that the double curved pair at present in general use, how much soever it may since have been altered by the ingenuity of our brethren, is in fact a compound of the exertions of Levrèt and Smellie. In the hands of an ignorant practitioner, the one with a single is more manageable than that with two curves, since either blade may be introduced first, at the right or left side of the pelvis, according to the option of the operator; but with the double curved pair, a correct knowledge of the position of the fœtal head is indis-

pensable to their accurate application. The one will bear no comparison with the other in regard either of power or safety; for the double possesses prodigious advantages over the single curved pair in these respects, while it is likewise much better adapted to the form of the pelvis. It embraces the head by a greater number of points of contact than the single curved; while, when properly applied, the cranium so greatly ranges beyond its grasp, that it cannot injure the maternal structures, a thing unavoidable when the other variety is used.

Except to describe the instrument which was put into my hands when I began, and have constantly used since I have been in practice, I shall not enter further into the history of the forceps, for the task would be endless, since few who have taught or extensively practised midwifery, have failed to dabble in inventions of their own, or to modify and appropriate those of others. The forceps which I use, very nearly resembles the one delineated in Dr Wallace Johnson's System of Midwifery. It is an inch longer than his; the blades also are a little broader, and have a wider space betwixt them. When the curves are formed, the whole instrument measures about a foot and half an inch in length. Of this, the blade and shank occupy seven inches and a quarter; and the handle, including the lock, five and a quarter. The widest part of the space, transversely betwixt the blades, measures three inches; but if these be included, three and a quarter. The broadest part of the blade across its fenestrum, is an inch and three quarters. It is perfectly plain, without a hinge to the right hand half, as is sometimes added, but which I do not conceive to be any advantage; on the contrary, it only renders the instrument less secure, and more apt to include the maternal structures. The steel should be well tempered; every part of it carefully polished; and the lock so accurately formed, that the one shank shall as nearly as possible occupy the whole of the space which its opponent presents for its reception. The elongation of the handles by an inch, will give the practitioner more power than he possesses by a shorter instrument; and he will be enabled to embrace the head by it when above the brim, thus rendering the possession of the common long pair unnecessary.

Though it may be gleaned from the observations which have now been offered in this class, what are the particular circumstances which call for the application of forceps; yet, a very summary recapitulation of them may not be unacceptable to some of my readers. Labours protracted

by debility, local or general, from whatever cause produced, and such as are accompanied by some formidable complication, frequently require the aid of this instrument. Of the latter, the local or constitutional irritation arising from the long detention of the head in the pelvis, has been already noticed; and we may add, convulsions, hæmorrhage, syncope, rupture of the uterus, distension of the bladder, malposition of the head, trivial confinement of some region of the pelvis, and protrusion of the funis. Another question which often arises in the breast of a young practitioner, in anxious attendance at the bed-side, and of which a very brief solution may again be offered is, How soon is forceps to be used? No previous condition of the patient can enable a practitioner to solve this question; it can only be determined in the progress of labour. *It may, however, be repeated, that while the delivery is advancing, and the patient continues free from unfavourable symptoms, the use of the forceps is to be abstained from altogether.* But whenever the progress is slow and imperceptible, and the subordinate means already recommended have failed to accelerate the transit of the fœtus, the case should be watched, and this instrument applied with very little delay after the passages are prepared; and instantly thereafter, should any symptom of local or constitutional irritation arise. As its premature and dilatory use may either of them lead to unpleasant consequences, if the practitioner has not enjoyed such opportunities as would enable him to determine with confidence its necessity, and conduct with safety its application, he should request additional assistance, that the patient may neither suffer from procrastination nor maladroitness. There is not, perhaps, an expedient connected with the art that has been more abused than this; for if, in some instances, misfortunes have arisen from its use having been too long, or altogether withheld, in consequence of the timidity of the medical attendant, there is too much reason to apprehend, that its premature application has more frequently led to the most mischievous consequences. That it has been too often employed, not so much to minister to the necessities and sufferings of the patient, as to save the time of the practitioner, *post-mortem* examinations have occasionally corroborated. Conduct like this, however, cannot long escape detection, since it is liable sooner or later to be attended by accidents too painful and serious for concealment, as contusion and laceration of some internal structure, which may lead to public investigation, and entail lasting disgrace on its author. How many of the sex are to be met with who have been reduced to a loathsome condition,

by too early and unnecessary interference. At the same time, it must be confessed, that the evils attendant on the application of instruments have often been egregiously exaggerated; and that the character of the medical attendant has been assailed when he was not to blame, but where his aid had either not been required in time, or where nature had not been true to herself. Though nothing certainly can be more injurious to the prospects of any one, than the reputation of being too prone to use instruments, yet it should be known, that forceps, when employed by a person whose hands have acquired dexterity by practice, and whose judgment has been matured by frequent reflection on the important considerations which must regulate his conduct, is perfectly safe in its nature, and that it does not increase the sufferings of the patient, or endanger the life of the fœtus; while it is certain, that its timely application has frequently warded off impending dangers, and led to the most happy results. Though patient forbearance is commendable, yet as no benefit can accrue from delay, after delivery with forceps is safe and practicable, the medical attendant should embrace the earliest opportunity to avail himself of the application of this auxiliary, lest he may acquire another character, which would be as destructive to his peace of mind, as it would be to his worldly prospects, viz. that of bringing many still-born children into the world, and losing many females in child-bed!

When, from the case being tardy in its progress, or from any other cause, we apprehend that forceps may eventually be required, the attendants should be made acquainted with our suspicions, before they are disclosed to the sufferer herself, that by timely and prudent hints on their part, her mind may be in some degree prepared for what is to happen. Instruments should never be applied unknown to the friends, though, in the case of a timid female, it may be necessary to use them without her knowledge. When it becomes obvious that this mode of affording assistance cannot be dispensed with, it will strengthen the hands of the practitioner, or in other words, facilitate his progress, to explain delicately to the patient the nature of the means by which it is intended to relieve her. At the mere mention of instruments, the sufferer is led to think that some cutting contrivance is to be used; and to remove this erroneous idea, the practitioner must state that the expedient to be resorted to is a pair of artificial hands, to embrace the head of the child, to shorten the duration of labour; and that it is incapable of inflicting the least injury on either mother or infant.

The use of forceps should be exclusively limited to presentations of the head, and the following are the positions which require its application; *first*, when the face is towards the sacrum; *secondly*, when it is at the right; *thirdly*, at the left ilium; and, *fourthly*, when it is directed to the pubes. The *common short pair* are inapplicable, unless the head be two-thirds in the pelvis, or an ear can be felt, nor should an attempt to employ forceps of any description be made, until the os uteri be fully dilated or nearly so. It has already been stated, that by lengthening the handles of the short pair one inch, they may be used when the head is above the brim; but the facility of embracing it with the instrument, will always be in proportion to its advance. We must ascertain that the urinary bladder and rectum have been properly evacuated, before its introduction has been commenced, lest either organ might suffer from pressure. The position of the woman should be the same as recommended in natural labour; but to prevent a novice in the use of instruments being foiled while introducing the upper blade, the breech of the patient should be brought close to the edge of the bed, and raised by a pillow placed under it. And to facilitate our access to the external parts, as well as to render the introduction of the instrument more easy, a pillow must also be placed betwixt the knees. While we are introducing either blade, which should always be done delicately, slowly, cautiously, and by gentle insinuation rather than by force, the patient is sure to complain, entirely from fear, that we are pinching, tearing, and cutting her; and to prevent the attendants, who naturally enter into the feelings of the sufferer, imbibing unfavourable impressions of our conduct, we must be prepared to afford a proper explanation of these imaginary injuries. Sometimes while engaged in this duty, also, the sphincter vesicæ gives way, and the urine escapes, which, were he not aware of the liability to such an occurrence, might lead a young operator to think that he had inflicted some serious injury on the bladder.

Upon the supposition that the presentation has been accurately determined, and that the head is in the first position described, I shall proceed to point out the manner in which forceps should be applied. As a preliminary step, the situation of the ear, anterior fontanelle, or lambdoidal sutures should be known, to ensure the proper application of the instrument, which, when the preference is given to the double curved pair, should be so inserted that its convex margin shall always from the first, or eventually, be directed toward the sacrum. Neither the ear nor the bregma can be

reached with the finger, unless the head be well advanced; but if the lambdoidal suture can be traced, and the blade be run along the parietal side of it, we may rest satisfied with the accuracy of its application. In consequence of the long detention of the head, and swellings of its teguments from pressure, it is so difficult to trace its characteristic points, that a young practitioner will find himself much at a loss in determining its exact position, unless an ear can be felt.

Some tepid water and a little unctuous matter are to be furnished to warm and anoint the instrument, with a view to facilitate its insertion, and to prevent its occasioning any uncomfortable sensations to the patient. The practitioner is now to advance into the vagina, betwixt the right side of the pelvis and the presenting part, the index finger of the left hand, *not two or three fingers*, as some writers absurdly recommend but can rarely accomplish, until the ear or some other distinguishing point can be described, when he is to introduce the upper *or right hand blade* betwixt the finger and the child's head. When we begin to insinuate the instrument into the os externum, its clam should first be laid flat on the perinæum, that it may the more easily slip round the head: the finger being previously inserted, will act as a guide to it, and prevent it pinching the parts. We are to advance the blade by gentle insinuation, and as it passes onwards, its handle must be slightly raised towards the right thigh of the patient, in order to keep the clam in contact with the head, and prevent the possibility of its injuring the maternal structures. The insertion must always be undertaken in the absence of a contraction, or if one should supervene while we are engaged in this duty, we are to desist *pro tempore*. When the point of the clam has passed over the parietal protuberance, its further introduction to the necessary extent is speedily effected. This duty, when accomplished with the necessary dexterity and caution, in a case where everything is favourable, is productive of so little suffering to the individual, that I have often heard females express their astonishment that they had not experienced greater uneasiness. As this has to act as a director for the second blade, it should be accurately applied, and when it is so, the extremity of the clam will be parallel with, and at a distance from, the angle of the mouth; its fenestrum will embrace the right ear; and the lock will be about one inch and a half from the scalp.

The left hand blade is to be insinuated between the fœtal head and left side of the pelvis, similarly prepared, and exactly under similar cautions with the right. It is more diffi-

cult of application than the right, and indeed it sometimes gives trouble. The handle of the inserted blade must be raised towards the pubes, that space may be afforded for the one about to be introduced, to enter betwixt it and the perinæum. The only secret, if such it can be considered, in the application of forceps is, to have the second blade so placed that it shall describe a perfect antagonist to the first, or that the flat side of one handle shall be directly opposed to the same surface of the other. When it has been sufficiently far advanced, both handles are to be brought into opposition to effect their locking, which is often attended with some difficulty, and which invariably arises from the blades not being properly applied, or not being placed on corresponding points of the cranium. Forceps, when correctly introduced, will lock with facility; but when it does not, no force is to be employed to accomplish this: the safer plan by far is to withdraw a little the blade last introduced, which is generally in fault, that the necessary change may be made in its position. In the hands of a novice, from twenty minutes to half an hour may elapse before they can be properly locked; but by a practised operator this may often be accomplished in two or three minutes. In doing this, care must be taken not to include the hairs of the pudendum, or a portion of the external genitals. A very correct way of estimating the size of the cranium, as also whether the instrument be correctly placed, is by marking the space betwixt the extreme ends of the handles; in the largest healthy head, it rarely exceeds an inch, after the forceps is properly locked.

With the first pain, after the instrument has been adjusted, the extraction must be commenced. This is to be exerted in the direction of the handles, or the pendulum-like motion is the one which must always be adopted. When there are pains, the extraction must commence and cease with them; but when uterine action is suspended, our efforts are to be renewed every ten minutes, and they are to equal in duration that of uterine contractions in their natural state. Traction is at first to be gently exerted, but its power must be gradually increased according to the degree of resistance experienced; and the efforts sometimes require to be considerable. In the commencement, the handles are to be directed towards the sacrum, in the axis of the brim, until the vertex be fairly lodged in the arch of the pubes; when, with every additional extracting effort, the inclination of the handles is to be reversed, and they are very gradually to be brought into the axis of the outlet. In a primary labour, from an hour to an hour and a half may elapse before the

head can be extracted; but where an individual has formerly had children, it may be accomplished in less than a third of this time: we are not, however, to promise to effect it in any given space, or prescribe to ourselves any particular period, but always proceed in such a manner as shall give the patient the least uneasiness. The perinæum is to be carefully supported, and after a considerable portion of the cranium is protruded from the vagina, if the pains, when present, are sufficiently powerful to justify us in thinking that they can accomplish the protrusion of the remainder, the forceps should be withdrawn. The advantage of this method is, that we can afford greater protection to the external parts, which might unavoidably be injured by the forceps during the transit of the head, were the woman at all restless.

The expulsion of the body should be left to the action of the uterus, to convince the practitioner that this organ is capable of contracting, and that his mind may be relieved from every apprehension of subsequent hæmorrhage. To accelerate the transit of the body, the patient should have a little cordial after the head is born; and frictions with the hand should be applied over the uterus.

When it becomes necessary to apply forceps when the face is placed toward either ilium, the management of such a case is much more difficult than the preceding. It is to be distinguished by the position of the bregma; of the ear, when it can be reached; by the direction of the sutures; and the absence of a perinæal tumour. If the face be to the right side, the corresponding blade must be inserted between the pubes and the head; or if to the opposite ilium, the left hand blade must be introduced between the pubes and the cranium, and its counter part next the sacrum.

We shall suppose that the face is directed to the right ilium, in which case the practitioner is to advance the index finger of the left hand under the pubes until he reach the ear, when the right blade of the instrument, prepared as formerly advised, is to be inserted. In doing this, the handle is to be directed backward between the thighs towards the coccyx, while the extremity of the clam is to be insinuated under the labium, and gradually carried up in the cautious manner recommended in the preceding operation. To keep the extremity of the blade in contact with the head, the handle is to be raised towards the pubes, as the instrument advances in the pelvis. When this has been accomplished, its handle is to be moved to the left thigh, to afford space for the introduction of the second blade. In applying

this last, let it be carried along the back part of the patient's right thigh, and its extremity insinuated between the anterior margin of the perinæum and the head; and as it advances along the hollow of the sacrum, let the handle be gradually inclined in the direction of the coccyx, and brought to such a position ultimately, that it shall be a direct antagonist to its counter part under the pubes. Much difficulty is often experienced in the introduction of this part, but the practitioner must persist perseveringly, but cautiously and patiently, in his exertions, which he should not relinquish without repeated careful trials.

When the introduction has been accomplished, both handles are to be brought into apposition, and locked with the same precautions, in reference to the external parts, as formerly pointed out. The extraction is to be exerted in the direction of the coccyx, and the handles are to be moved gently from sacrum to pubes during pains, or occasionally in their absence. When the head comes to press on the perinæum, the face, during every subsequent extracting effort, is to be inclined towards the sacrum, while traction is to be exerted in the direction of the outlet, by reversing the position of the handles. Until the face is turned towards the sacrum, the movement with the instrument is to be exerted with great gentleness, that no undue pressure may be exerted by its converging points upon the structures of the parent. After the head has been reduced to the first position, the delivery is to be brought to a conclusion, according to the rules laid down in the first forceps case.

When the face is at the left ilium, the corresponding blade is to be placed between the pubes and the cranium, and the right slipped up along the sacrum. Thereafter the head is to be brought down until it render the perinæum tense, then reduced into the first position, by bringing the vertex from the right acetabulum into the pubic arch, after which, the extraction is to be accomplished, as if the face had originally been directed towards the sacrum.

The fourth position, or that in which the face is placed toward the pubes, sometimes arises out of the changes which take place during the descent of the head, in those cases of malposition formerly particularized in the first order of this class; but more frequently, the face is placed towards either acetabulum, from the time the head begins to engage in the brim, and is gradually advanced into the arch of the pubes. In this case, the instrument is to be applied, in relation to the parent, exactly as in the first forceps case; but relatively to the infant, the concave margin of the blades will be di-

rected to the face. The vertex is the part which must be first disengaged, to accomplish which the handles are to be inclined towards the abdomen, until it begin to pass over the perinæum, when their position is to be *gradually* reversed, that the face may be disengaged from under the pubes.

Sect. III.—*Application of Long Forceps.*

Long forceps differs in no respect from the short pair, except in point of length, which renders it a powerful, and consequently a dangerous agent. The cases for its application, are those in which the head has not entered the brim. Dr Smellie was the first who used it under these circumstances; but so strongly was he impressed with its formidable nature, that he neither recommended it to others, nor did he even exhibit it in his lectures. And from what has happened to myself, I am disposed to believe, that labours requiring its aid are of very rare occurrence; in which opinion I am supported by men who have long practised, and enjoyed very great advantages. In a pretty extensive practice of twenty-seven years' duration, I have eleven times found it necessary to embrace the head before it entered the brim. Certainly its application, except by a person well experienced in the use of the ordinary pair, should not if possible be attempted. And another principle which should be impressed on the mind of every one is, that the employment of such a power should be abstained from, until it has been determined by prudent delay, what the efforts of the parent are capable of accomplishing.

The head may be prevented from entering the brim, by contraction of this opening. If, according to the principles already laid down, its transverse diameter be less than three inches and a half, the head, unless it were small, could not be brought through such an aperture, without an extent of compression that would render it destructive to the fœtus, and in all probability most injurious to the parent. As we cannot say, unless the deformity be very considerable, that the degree of narrowness is such as to interdict the attempt, the instrument, when the efforts of the parent are unavailing, should have a fair and patient trial. The same rules are to be observed in the introduction of the blades, as were specified in speaking of the ordinary forceps, viz., the right or left is to be inserted between the pubes and the head, according as the face shall be directed to either side of the pelvis. Since the face is generally at the right ilium, the right hand blade, *in such a case*, is to be inserted first, between the

pubes and the head, and the left on the opposite side. It is very desirable, that the instrument should be conducted towards the proper points of the cranium by the fingers, and when they are long, this may be effected; or in some instances, the hand even may be advanced into the pelvis. The brim, however, may be so narrow in its sacro-pubic diameter, that forceps could not be applied in the manner just directed; in which case, an attempt must be made to push up the clams at the ilia, in such a way that the one will be placed on the vertex, and the other on the face. This I have done repeatedly, without, in the least degree, disfiguring the countenance of the infant. If we have succeeded in bringing the head into the pelvis, the instrument should be withdrawn, and an opportunity afforded to the natural efforts to accomplish the delivery. When, on the other hand, the head is immoveable, and cannot, after a careful trial continued for a reasonable period, be made to engage in the brim, or make any perceptible advance, the attempt must be relinquished, and the case referred to the third order.

Besides contraction at the brim, it may sometimes be necessary to use a lengthened instrument, where it would be desirable to accelerate delivery before the head has engaged in this opening, as in cases complicated with syncope, hæmorrhage, or rupture of the uterus,—accidents which are soon to be considered.

In some very rare instances, the head, as already observed, enters the brim in such a position, that the long diameter of the former is opposed to the short diameter of the latter, the brow being at the pubes or promontory of the sacrum. An attempt is to be made to remove it from this awkward position, by embracing, and cautiously pushing it upwards with long forceps. If success attend the trial, and if the face has been towards the sacrum, the head is to be brought into the pelvis, with the face at one ilium, and the vertex at the other. But if the face be at the pubes, and if we have succeeded in disengaging the cranium, it is to be drawn down with the face towards that acetabulum to which it may be the most inclined. No attempt should be made in this last case, to turn the face to the sacro-iliac symphysis, lest twisting the neck might destroy the fœtus.

A lengthened instrument may sometimes also be required, when the face presents, with the chin to either ilium, or to the pubes; and when the powers of the patient have been so much exhausted, as to render her efforts ineffectual. The object is, first, to depress the brow, and thereafter the occiput.

Sect. IV.—*History and Application of the Lever.*

The vectis, lever, or single blade, as may be perceived by the preceding observations, sprang from the forceps, since the one employed by Roonhuysen is the first of which we have printed records. It would be idle to say much regarding this contrivance in its original state, since it is now entirely exploded. Suffice it to remark, that it consisted of a flat piece of well tempered steel, eleven inches long, one broad, a line and one half thick; straight towards the middle, but slightly bent at each extremity. It was directed to be covered with thin soft leather, and other materials interposed, to prevent it exerting too much pressure either on the fœtus or parent; and when thus prepared, it was about three-eighths of an inch in thickness; but the article which is now exhibited in the lecture-room, as a *fac simile* of the Roonhuysen lever, is no more like the original, than the forceps at present in general use, is like that invented by the Chamberlens. This instrument, in its original form, has nothing to recommend it; on the contrary, the most superficial examination must show, that its employment before the head descended through the pelvis, would be replete with danger to the parent, since it could not be applied without making her parts a fulcrum. To obviate this powerful objection, the lever has passed through successive changes at the suggestions of Mr Dease, and Drs Bland, Baudelocque, and Lowder. The two former have directed the curve of the instrument to be made a little deeper, whereby its point will more readily fix upon the part to which it is applied, rendering it a more dangerous agent than formerly, since, independently of its still requiring the parts of the parent for a fulcrum, it must now also press injuriously on the fœtal head, an objection not applicable to the original.

Dr Lowder has completely changed the character of the lever, by still further increasing its curve, whereby the operator is enabled to use it without any fulcrum, whence it is now properly speaking a blunt hook, and may be employed not only with perfect safety, but, under circumstances to be soon described, with considerable effect. It is formed with a blade and handle, which, in all, before the curve is made, measure twelve inches and a half; the formation of the curve diminishes its length by an inch. To render it more portable, it is sometimes furnished with a hinge; and when thus constructed, the curve commences about half an inch nearer the blade. At the beginning of the curve, the blade is half an inch in breadth, and increases to within three quarters of an

inch of its extremity, where it measures one inch and three fourths. Two inches and a half from the extremity, which is semicircular, commences an oval fenestrum two inches and a fourth in length, and one and a quarter at its greatest breadth. By this aperture, the curve, and consequently the extracting power of the instrument are greatly increased, without rendering its application more difficult. By some practitioners this contrivance has been preferred to the forceps, and there are circumstances, it must be admitted, under which such a predilection is justifiable, as will be shortly noticed; but in every case in which expedition is an object, and in which there is adequate space in the pelvis, the forceps must certainly have the preference. For as it consists of two equal parts, which, when locked and properly adjusted, act as antagonists to each other, and is consequently capable of direct extraction, it possesses infinite power over the lever. As this last, except when applied over the face and chin, can exert no direct traction, but presses the presenting part rather to one side, its operation must be slow. There is no doubt that the hook may be safely applied in any instance manageable by forceps, though not with equal expedition; but the cases in which the vectis is particularly available, are, *first*, where the brim of the pelvis is rather contracted; *secondly*, where the face presents; and, *thirdly*, where only one blade of the forceps can be introduced, of which, *in defiance of all authority to the contrary, occasional examples occur.*

Lowder's instrument will be found of great utility in some of the cases for which long forceps has been recommended, as those of arrestation of the head from contraction of the brim; and in the hands of gentlemen inexperienced in the use of the latter, I should certainly consider the hook the safer of the two. It will not, it is true, act with such power as forceps; but this is one of the principal reasons why a novice should prefer it; and another argument in its favour is, that it is not at all likely to exert any injurious pressure on the pelvic linings, a thing which is unavoidable, by the converging points of the double-bladed instrument, in attempting with it, by a movement from blade to blade, to effect the descent of the head through a narrow brim.

In applying the hook when the head is on the brim, no change is to be made on the position of the patient from that which is observed in natural labour. Besides narrowness of this opening, a further inducement for resorting to the hook, is exhaustion either of the parturient organs or of the system in general, from previous indisposition, or protracted efforts during labour. The instrument is to be introduced between

the pubes and the head, and conducted upwards under the protection of a finger along the ear, until it can be fixed on the mastoid process of the temporal bone. In commencing the insertion, the concave surface of the clam is first to be laid flat on the perinæum, and after its point is insinuated under the labium, and brought in contact with the head, the handle is to be gradually elevated towards the pubes, by which manœuvre the extremity of the blade will be effectually prevented coming in collision with the structures of the parent. When the instrument is applied as now directed, the next points which require particular attention, are, *first*, to avoid making a fulcrum of any part of the parent; and, *secondly*, to give a proper direction to the extracting efforts. Until the head is brought into the pelvic cavity, the handle of the instrument is to be inclined towards the coccyx. Traction is to be exerted by the practitioner grasping its handle in his left, while he applies his right hand to the shank, to preserve the blade in firm contact with the part on which it is applied; and during every pain he is to draw down. By holding the instrument in the position now recommended, we completely avoid making any part a fulcrum, and the patient ought not to be sensible of any uneasiness except what proceeds from uterine action. At first the traction is to be exerted gently, until it be ascertained that the blade is firmly fixed, when the extracting force is to be progressively increased. Uterine action, however trifling, will greatly aid the efforts of the practitioner, but unless this be present, the operation will prove extremely tedious. The extraction is to be persevered in until the face turn towards the sacrum, when the hook is to be removed from its situation, and applied over the chin and face, which will afford a very secure hold. Where there is no call for expedition, the extraction of the head may be completed with this agent; but should any adventitious cause, as convulsions or hæmorrhage, require an acceleration of the process, the ordinary forceps should be used after the head is attainable by this instrument.

Another set of cases in which Lowder's instrument may be used to advantage, is where, in consequence of some particular conformation of the pelvis, both blades of the forceps cannot, in a delivery requiring acceleration, be introduced. Though the existence of such cases has almost been denied, yet I can aver, that I have repeatedly met with them. When they do occur, this instrument, applied as already directed, will materially assist the efforts of the parent.

In face presentations also, this instrument will be found of

great utility in aiding the efforts of the parent. It may either be applied to the brow to push it up and favour the descent of the vertex, or fixed upon the occiput to reduce the case to a vertex presentation.

When the chin is in the hollow of the sacrum, which of all the face cases is the most difficult to manage, we must endeavour by the hook, to remove it from its situation to that sacro-iliac junction towards which there is the greatest inclination; and thereafter apply the instrument to the occiput, with a view to bring the vertex obliquely on the opposite side of the pelvis. In these cases the fœtus is generally lost from pressure, so that the safety of the parent is what the practitioner has chiefly to study.

In a presentation of the side of the face and ear, if the case cannot be managed by the finger, as already prescribed, the hook must be passed over the head, and its extremity fixed behind the *upper ear*, with a view to bring down the vertex. Another method which has been recommended by some practitioners in face cases, is turning; which, unless we are in attendance before the liquor amnii has escaped, cannot benefit the fœtus, and may greatly endanger the parent.

Order III.

When the practice which has been recommended in the cases considered in the two foregoing orders cannot be rendered available, it then becomes a question, what are the other resources which may be adopted for effecting the separation of the fœtus from the parent. To fulfil this intention, the four following operations have been long proposed, viz. Embryulcia, the Cæsarean Section, the Cigaultean Operation, and the Induction of Premature Labour. The first has for its object the preservation of the mother alone; the remainder that of the parent and child.

Before discussing the merits of these operations, it will be necessary to point out the circumstances which may induce the medical attendant to make his selection. At one period, these were considered very numerous, but the many discoveries which have resulted from the labours of practitioners of modern times, have suggested for some of them other modes of relief, both safer and less formidable than those previously resorted to. One or other of the operations mentioned has been thought necessary, from the following causes: *first*, imperviousness of the os uteri; *secondly*, scirrhosity of this aperture; *thirdly*, partial or total occlusion of the vagina; *fourthly*, cicatrices of this canal; *fifthly*, tumours growing

from some structure within the pelvis; *sixthly*, cohesion of the labia; *seventhly*, enlargement of the head from overgrowth or disease; *eighthly*, an incompressible state of its bones from premature ossification; *ninthly*, impaction of it; and, *tenthly*, narrowness of the pelvis from arrested development, or malformation of the bones.

That the conditions referred to will require one or other of the modes of practice particularized cannot be questioned; but, extraordinary as it may appear, owing to particular religious tenets, which in some degree still continue to influence those of our art who profess them, it was supposed that we were not justified in destroying one life to save another, and that one of the operations in question should not be resorted to at all, until we had ascertained that the fœtus was dead. Though this knowledge would be highly desirable, as it would justify an earlier performance of the practice in question, by which the strength of the patient would be economized, and her sufferings alleviated, yet none of the symptoms, the stethoscopic signs and want of pulsation in the funis excepted, are infallible.

Sect. I.—*Signs of the Death of the Fœtus.*

These may be considered under two heads—the maternal and fœtal. To the *first* may be referred rigors, flaccidity of the mammæ, coldness of the abdomen, diminution of its size, sense of weight in the hypogastric region, fœtor from the vagina, and the escape of air from the uterus. Under the *second head* may be enumerated cessation of fœtal movement, want of pulsation in the anterior fontanelle and funis, separation of the cuticle, flaccidity of the integuments of the cranium, and disunion of its bones, relaxation of the lips and of the sphincter ani, the escape of meconium, and the absence of the stethoscopic phenomena. Although some of the foregoing signs are undoubtedly unequivocal, yet we cannot always be aware of their presence; while the remainder, which certainly constitute the great majority, are doubtful, or cannot be at all relied on.

Rigors, though almost invariably noticed by a female at a period coeval with that when fœtal life became extinct, cannot however be relied on, since it may arise from a variety of other causes, totally independent of that under consideration. But when this sign is attended by unusual fœtal struggles, both collectively may be considered good evidence of the death of the fœtus, and more especially where fœtal movement has thereafter ceased to be perceptible. *Flacci-*

dity of the mammæ is not much to be depended on, since in some women these organs are not always tense at any period of gestation; but where they have been so, and have abruptly, subsequently to the sign last considered, become relaxed and much diminished in size, such a state may be considered important. *Diminished size of the abdomen*, in connection with the foregoing signs, may be considered a valuable one; but a sense of coldness in that cavity, and of weight in the hypogastric region, are quite secondary, or of no importance. *Fœtor* from the discharge which escapes per vaginam during labour is certainly a suspicious circumstance, and to practitioners of experience in the operative department of midwifery, sufficiently familiar. When it arises from the death of the fœtus during labour it is speedily perceived; and although the author will not undertake to offer a comparison of it, nevertheless it will be admitted by a person of acute sense of smell, not only to be peculiar, but most tenacious. It must be admitted, however, that in occasional instances the most horrid fœtor emanates from the sexual passage during labour, where the fœtus is not only alive but healthy; and although my sense of smell is by no means acute, I have in repeated instances been struck with the offensive nature of this odour, and until my deductions were corrected by experience, ready to believe that the fœtus was dead. On the escape of *fœtid gas* from the uterus we cannot for a moment rely as a sign of fœtal life being extinct, because the duties to be performed by the practitioner do not require that he should be in such near connection with the patient as to be aware of its presence, unless its volume were very considerable, and because I think it would be difficult or impossible to decide whether the odour emanated from fœtid air or the discharge from the vagina.

Under the second head the first sign to be considered is *cessation of fœtal movement*, which is one of the most equivocal of the catalogue; in proof of which I need merely state what must be familiar to every individual who pretends to a knowledge of obstetric practice, viz. that in many instances of matrons even, no fœtal movement is perceived for many days or indeed weeks; and that this intra-uterine torpor might readily mislead the inexperienced, were it not for the progressive enlargement of the abdomen, and the absence of other evidence. On the other hand, it is equally well known that experienced matrons even, by confounding with fœtal movement flatus in the intestines, or trivial and occasional contractions of the uterus when that organ was disposed to dislodge its contents, have declared that they had been sen-

sible of intra-uterine life up to the moment of delivery, though, from the extent of decomposition, it was but too obvious that the fœtus had been long dead. On *want of pulsation in the anterior fontanelle* it is scarcely necessary to offer a comment, since, generally speaking, the more healthy the fœtus the more contracted will be this opening, and the more obscure the pulsation; and since in the majority of instances, even when intra-uterine life is vigorous, the pulsations at this point are not to be felt at all. *Want of pulsation in the funis* is a sign on which implicit reliance may be placed, but one, unfortunately, of which we can seldom take advantage, since the cord so rarely protrudes; and its sounds cannot always be recognised by the stethoscope. Moreover, the prolapsed and pulseless cord might not belong to the presenting fœtus, but to a companion in utero. *Separation of the cuticle*, though at one time, naturally enough, considered unequivocal, is not however an infallible sign. I have myself, in cases of congenital syphilis, and other affections of the cuticular tissue, been sensible of separation of the cuticle on the scalp and nates during labour, where the fœtus was born alive; and corresponding observations have been made by other practitioners. Exfoliation of the cuticle from the arm, where it is protruded from the os externum during labour, may be considered a conclusive sign that the fœtus is dead. *Flaccidity of the integuments of the cranium, and disunion of its bones*, or the latter floating freely, as it were, within the former, are signs by which I have never been deceived: these are decisive evidences of the cessation of intra-uterine life. *Relaxation* of the *oral lips*, and of the *sphincter ani*, when these can be felt, are pretty certain signs that the fœtus is dead; while if it be alive, and a finger be introduced into the former, it will be firmly embraced, or into the latter, it will be felt contracting. The *escape of the meconium* is as uncertain a sign as any that have been considered. When the head presents even, and labour has been protracted, the foregoing sign cannot be viewed in all cases indeed, as evidence that the fœtus is exposed to injurious pressure, though the contrary was at one time a general belief. I have seen the liquor amnii contain a large quantity of meconium where the labour was rapid and the fœtus vigorous.

Of all the signs enumerated, the absence of the sounds afforded by the fœtal heart and the umbilical cord are the most conclusive evidence of the fœtus being dead. These will be found fully considered in the section on the signs of pregnancy. In passing, however, it may be observed that

during a protracted labour a *practised ear* may be able to determine that the action of the fœtal heart is becoming weaker, and has thus afforded an indication for accelerating delivery. Although the present is a sign of great value, we must not overlook the possibility of the sounds in question being so obscured by a variety of causes that an experienced auscultator even, may hesitate to declare whether the fœtus be dead or alive. The fœtal sounds may become indistinct from an enfeebled state of its circulation, profusion of liquor amnii, the placenta being situated between the back of the fœtus and the uterus, and a portion of intestine being placed between the latter organ and the abdominal parietes, though this latter is of very rare occurrence.

Various other signs have been adduced as evidences of the death of the fœtus, such as vomiting, lividity, or paleness of the countenance, an inanimate state of the eyes, and their subsidence in the orbits, fœtid breath, and general languor; but all these are so unconnected with the extinction of fœtal life that it is unnecessary to enter into a refutation of them.

Finally, although it is of little importance after perforation has been performed, to inquire whether the fœtus has been dead or alive at the time, nevertheless it may be satisfactory for the practitioner to know, that unless there has been a copious discharge of fluid blood at the time of the operation, he will have no cause to suppose that he has been precipitate in his proceedings. While, on the other hand, when the fœtus is dead, the only appearance of blood will be a few small coagula intermixed with the cerebral matter.

Sect. II.—*Irregularities in the Formation of the Pelvis.*

Of all the causes enumerated, for adopting the modes of practice particularized, irregularities in the formation of the pelvis is the most frequent. These may arise from arrested development of this region of the skeleton, a vitiated condition of it from disease, exostosis, and preternatural capacity.

The pelvis of arrested development may be of two kinds; *first*, where it is fully ossified, correctly shaped, but considerably reduced below the natural standard, and devoid of those peculiarities by which it is characterised in the young subject. This variety may occur in females of any stature, and be observed frequently enough, even in collections which are not at all extensive. As the symmetry of the body may be correct in such cases, we cannot often, in the living subject, be aware of this condition of the pelvis, unless an opportuni-

ty be afforded of seeing the individual undressed, or attending her during parturition. If, externally, instead of that great breadth across the sacrum, by which a well formed female is characterized, this part was observed to be unusually contracted; while also, the anterior spinous process of each ilium were obviously less distant from each other than what might be remarked in a pelvis of full formation, it would be a legitimate, though not positively a correct inference, that its development was arrested. I have frequently inquired into the cause of this condition, and satisfactorily as I thought, in repeated instances, traced it to the influence in early life of the individual having been subjected to a sedentary occupation, laborious employment, and defective nourishment. In some instances, again, I failed to elicit any circumstance which could account for the arrested development.

The *second variety* is said to be met with in persons only of low stature; I have not myself seen an instance of this kind; and it would seem indeed to have attracted so little attention in this country, that it is not even mentioned in some of the most respectable systematic works on midwifery. In this variety, although the individual be considerably advanced in years, her pelvis retains, more strictly than in the first, the characters by which we recognise that of a female who has not attained puberty; for it is not only of diminished size like that of the first variety, but its parietes are, moreover, thin, imperfectly ossified, and the cartilaginous structure by which the different portions of the ossa innominata are united in the young subject, are still distinct. Here too, although the pelvis is of correct shape, its diameters are considerably below the natural standard.

A vitiated condition of the bones of the pelvis may be produced by rachitis, or by mollities ossium; the former a disease of infancy, the latter of mature age.

The *rachitic pelvis* is characterised by the shallowness of the iliac fossæ, the distance between the ilia, their anterior superior spinous processes, the iliac diameter of the brim, and the space between the tuberosities of the ischia being unaltered or slightly increased; reduction of the sacro-pubic diameter and of the concavity of the sacrum, both longitudinally and laterally; great divergence of the rami of the pubes; in short, contraction of the brim, while the capacity of the outlet is unaltered, or slightly increased. Although the foregoing constitute the general characters of a pelvis affected by rachitis, yet a great variety may be observed in a given number of cases. The deformity may be general or

partial; but the brim is the region most frequently vitiated, by the encroachment of the promontory of the sacrum on the pubes, an alteration which a little reflection enables us to understand. When, by some morbid change, the solidity of the spinal column is diminished, the base of the sacrum, as it supports the head, upper extremities, and trunk, yields under their superincumbent pressure; and as the promontory of this bone enters into the formation of the lumbar curve, it is carried with the lower part of the latter more into the brim and towards the pubes. Another source of partial contraction at the brim arises from lateral curvature of the lower part of the spinal column, which leads to a reduction of that side of the brim corresponding to the spinal inclination, while the capacity of the opposite side is very little, if at all, affected. When the cavity alone is vitiated, this arises from the sacrum being too straight, and its concavity, as formerly noticed, being diminished both longitudinally and laterally. If the irregular formation be confined to the outlet, it will be observed to arise from too great an approximation of the tuberosities of the ischia, elongation of their spinous processes, and their consequent encroachment on the pelvic cavity; or there may be a considerable degree of incurvation of the coccyx, in consequence of anchylosis.

The *pelvis vitiated by malacosteon* is distinguished by closer approximation of the anterior superior spinous processes of the ilia; of the posterior to the anterior walls of the pelvis, and of the tuberosities of the ischia; increased concavity of the sacrum from the approximation of its extremities; incurvation of the rami, projection of the symphysis, and contraction of the arch of the pubis; diminished capacity of both brim and outlet, but especially of the former, and in a much greater degree than that of the rachitic pelvis. The malacosteon pelvis considered as a whole appears as it were pressed together from the sides, in the oblique direction.

When the deformity is general, or affects the brim, cavity, and outlet, the shape of the former aperture may be elliptical, the form of a kidney, or triangular. The first of these forms is generally supposed to result from rachitis, the last from mollities ossium; and Dr Hull, in his second letter to Mr Simmonds, in defence of the Cæsarean section, endeavours, by very plausible arguments, to support these opinions; but from the result of published cases, as well as from the means of illustration which I possess, I quite agree with Dr Ramsbotham in thinking that either disease may produce any of the varieties. Such indeed are the extraordinary changes produced in the apertures and cavity of the

pelvis from the diseases referred to, that a very great variety might be described in their shape and dimensions.

To Professor Nægelè we are indebted for a description of an additional variety of deformed pelvis; and as my information regarding it is derived entirely from his writings, the following particulars of it are almost a verbatim translation from his work on the subject.* It is designated the *obliquely contracted pelvis.* There is complete anchylosis of one of the sacro-iliac synchondroses, on that side there is arrested development of the half of the sacrum, diminished size of the sacral apertures, diminished breadth of the os innominatum, contraction of the sacro-sciatic notch, and the extent of the union of the sacrum with the innominatum, where the sacro-iliac symphysis should have been placed, is shorter on the side corresponding to the anchylosis. The sacrum appears as if pushed towards the anchylosed side, and the rami of the pubes to the normal side, so that the symphysis pubis is placed obliquely, and not straight opposite to the promontory of the sacrum; the anterior wall of the brim is less curved than natural; and the side on which the sacro-iliac symphysis is natural also differs in some degree from the normal figure. Owing to these irregularities, the diameter, extending from the acetabulum of the anchylosed side to the normal sacro-iliac junction, is diminished; but the diameter, from the acetabulum of the natural side to the anchylosed joint, is not lessened; and when the deformity is great, it is increased. The distance between the promontory of the sacrum and the region of the acetabula, and the point of the sacrum and the spinous processes of the ischia, is less on the anchylosed side than on the other. Between the spines of the ischia and the posterior superior spinous processes of their respective ilia, as also between the spinous processes of the last lumbar vertebra and the anterior superior spinous processes of the ilia, the distance is less on the anchylosed than on the normal side. And the distance between the inferior margin of the symphysis pubis and the posterior superior spine of the ilium is greater on the anchylosed than on the other side; the walls of the pelvic cavity converge downwards, and the pubic arch is contracted as in the male pelvis; on the affected side the acetabulum is directed forwards, but on the normal side outwards.

The talented professor thinks that this species of deformity does not arise from any external cause nor morbid condition, but from an original irregularity of formation.

Exostosis is the last cause of obstruction that I am to no-

* Das schräg verengte Becken, p. 7.

tice. This may trivially or extensively affect the capacity of the pelvis; and the exostosis may arise from the posterior or anterior walls of the cavity. By this term is to be understood a growth of osseous structure generated in connection with one of the portions of bone which compose the pelvis. While the origin of the bony tumour cannot occasionally be explained, I am satisfied that in some instances, at least, external injury is concerned. Some years ago there were under my management two females who gave the following account of themselves:—The one stated, that when three and a half years old she fell from a tree, and when she reached the ground struck the lower part of her back against a stone, which inflicted so severe an injury that the practitioner who was called on the occasion declared, that if she should attain maturity and conceive, she could never give birth to a living child,—a declaration which proved almost prophetic. Previously to her coming under my care she submitted to embryotomy in five successive deliveries, and twice, while my patient, to the induction of premature labour; and although uterine action was induced at the earliest period at which the fœtus could be thought to support an independent life, yet so great was the degree of pressure to which, on both occasions, it was exposed, that although born alive, the one died in convulsions on the eighteenth hour, and the other on the eighth day after birth. In both instances the parietal bones were found fractured. The second patient, when about the same age with the former, received so severe an injury on the upper part of the left thigh, that from the period of this occurrence she was deprived of the use of the extremity, and obliged to have the assistance of a crutch. In her first labour convulsions supervened during the second stage, and the brim of her pelvis was so vitiated that the head could not be embraced with forceps; and hence I was compelled to use the perforator. In the first patient, an unusual inclination of the sacral promontory was distinctly felt, but the cavity of the pelvis seemed well formed: and the individual was of the middle size. The pelvis of the second patient was obviously affected on the right side, for an incurvation of the corresponding ramus of the ischium and pubes could be felt, while the sacral promontory projected unusually towards the anterior and right side of the pelvis. In the external appearance of these individuals there was no circumstance which could have justified the inference that there was any irregularity of the pelvis. Dr Haber, whose thesis was sent me by Professor Nægelè, therein relates a case in which an exostosis of such enormous magnitude formed in the pel-

vic cavity, that the Cæsarean section was required: the formation of the tumour was ascribed to the individual having suffered a violent injury from a fall on the ice, after which she could not move, but in a few weeks she apparently recovered, married, and became pregnant. Dr M'Kibbin of Belfast operated for Cæsarean section in 1829 on a woman of that town, in whose pelvis, as would appear from a cast of it which was sent me, an exostosis of such enormous magnitude was generated in the hollow of the sacrum, as to leave a space of only an inch and one eighth between its extreme point, and the symphysis pubis. In this case also, similar to that related by Dr Haber, the growth was ascribed to an injury inflicted on the back from a fall, when the individual was six years of age. In this woman not only the trunk but the pelvis even, seemed, externally, well formed. It has been supposed that in females who, when young, have undergone amputation of a lower extremity, the opposite side of the pelvis, from receiving the whole weight of the trunk, would become vitiated. In 1825 I witnessed the dissection, a few months after delivery, of a woman who, when four years old, had met with so severe an injury of the right lower extremity, that for the remainder of life she could only walk with a crutch, but her pelvis was found perfect in size and shape; so that from what has been stated, it may or may not be vitiated from this last cause. In the course of my practice I have met with five cases of exostosis, from which the labour was either protracted or required instrumental interference. Besides those particularised, in a third patient, in consequence of a deposition having formed on the inside of the symphysis pubis, the fœtus was saved in two consecutive labours by the use of long forceps; in two previous deliveries this woman, while under the care of other practitioners, was obliged to submit to the crotchet and suffered severely. In a fourth instance, where a woman had previously borne ten children without assistance, long forceps was employed in consequence of a deposition on the inside of the symphysis, and the fœtus extracted alive after a protracted labour. In the fifth case, a woman of rather diminutive stature, a small exostosis was discovered in the hollow of the sacrum, and after an exceedingly painful labour of eighteen hours' duration, she was delivered of a small female child alive, without artificial assistance.

I owe to the kindness of my friend, Professor Fergusson, in the Chair of Surgery, King's College, London, a valuable specimen of pelvis with exostosis. The tumour originates principally from the last portion of the lumbar column, and

partially from the first of the sacrum, projecting $1\frac{1}{8}$ inch from the spine, obliquely towards the left innominatum. The pelvis is one of which all the diameters are below the natural standard: from ilium to ilium measures nearly $4\frac{6}{8}$ inches; from the extreme point of the exostosis to the top of the inner surface of the symphysis pubis $2\frac{7}{8}$ inches; from the right sacro-iliac joint to the left acetabulum $4\frac{7}{8}$ inches; from the left sacro-iliac symphysis to the right acetabulum $4\frac{5}{8}$ inches; from the most dependent point of the pubic symphysis to the extremity of the coccyx $2\frac{1}{2}$; and from the one tuber ischii to the other $3\frac{1}{2}$. The coccyx is anchylosed and considerably incurvated. The history of this preparation, so far as it is known, is very interesting. It was obtained from a subject which, in 1832, was exhumed from a neighbouring cemetery, and brought into a dissecting-room. It would seem, from appearances, that the medical attendant wished to accomplish the delivery by turning, in attempting which the whole of the fœtus had been brought through the brim and outlet except the head, which, on opening the abdomen, was found in the pelvic cavity—the body having apparently, during attempts at extraction, been torn from the head. In the fundus and corpus uteri there were two extensive lacerations.

As in the appearance of females in whom those obstructions exist, there is, generally speaking, no circumstance to be observed that would lead us to suspect their presence, we cannot be aware of such irregularities except by the exploration of the pelvis.

A *pelvis of unusual capacity* will naturally be considered, by those who are not conversant with midwifery, in a favourable light, since one which is very contracted must, as will presently appear, be a great misfortune. But however paradoxical it may seem, a pelvis which greatly exceeds the ordinary dimensions may be attended with distressing consequences to the mother and fœtus. I have seen preparations of which the longer diameters exceeded the ordinary size by $1\frac{1}{2}$, or nearly two inches.

In females with pelves of preternatural capacity there will, in the unimpregnated state, be great liability to protrusions of its viscera; and during gestation not only a longer continuance of the uterus therein, but even a prolapsus of this organ during the early months of pregnancy, giving rise to frequent and painful micturition, tenesmus, and hæmorrhoids. In one woman, under the care of the author's pupils, the uterus continued beyond the os externum, until within three or four days of the completion of the 5th month; and in two private patients of his own, from the close of the

third until the beginning of the fifth month. When the uterus is thus situated during gestation, it forms a tumour betwixt the thighs, gives rise to misplacement of the bladder and rectum, to functional derangement of these organs, and to great inconvenience during the performance of many of the ordinary duties of life.

It has also been inferred that preternatual capacity of this organ predisposes to retroversion of the uterus during gestation; which, however, I cannot confirm from my own experience.

Another, and not the least frequent inconvenience inseparable from a capacious pelvis, is the unexpected expulsion of the fœtus, especially where a woman has formerly borne one or more children. Cases must be sufficiently familar to the profession, where individuals have been delivered in the open air, or at home conducting their ordinary avocations, such an event being altogether unlooked for, and the fœtus being expelled with such rapidity and force, as to receive on coming to the ground, a severe contusion. And it would require no great stretch of imagination to suppose, that the parent too, under such circumstances, might suffer laceration of the perinæum, and injury of the uterus from the abrupt separation of the placenta, such as hæmorrhage and inversion.

Three different methods have been adopted to determine the extent to which the pelvis may be vitiated; *first*, by the general appearance of the patient; *secondly*, by pelvimeters; *thirdly*, by the exploration of the pelvis with the fingers. Though, as it is proper to premise, we cannot, in the living subject, determine to a fractional nicety the dimensions of the pelvis, yet it is of the highest importance that we should possess as accurate a knowledge as possible on this head, since it will enable us to alleviate a woman's sufferings by an early performance of embryulcia where it is actually required, or save her from the horrors of submitting unnecessarily to the Cæsarean section. As this investigation, therefore, involves the preservation or destruction of a fellow-being, it must be conducted carefully, deliberately, and repeatedly, to prevent the chance of an error.

External appearances are such, in very many instances, as to justify the inference that an individual is the subject of some irregularity in the formation of the pelvis, such as a general rachitic disposition, projection of the inferior beyond the superior maxilla, prominence of the chin, diminutive stature, an unsteady gait, distortions of the spine and of the lower extremities, obvious depression of one of the shoulders, prominence of the chest, and elevation of one of the hips.

These signs, however, cannot be depended on, for females apparently much deformed have been known to bear living children at the full time, with little more suffering than woman of perfect formation; while, on the other hand, patients who, to all external appearance, are of perfect symmetry, have been discovered with their pelvis so vitiated, as to be incapable of admitting the safe transit of a fœtus even at the beginning of the eighth month. Although these are facts which must be so familiar to every one who is practically acquainted with midwifery as to require no illustration, yet I cannot resist giving a brief abstract of two cases which are exactly in point. The one was that of a married female who was so distorted that her acquaintances were wont to compare her to the letter Z, and in her first labour was attended by a friend of mine, who had passed all his previous professional life in the public service; and although otherwise respectable in his profession, he knew nothing of midwifery, because he entered the service when young, and such a qualification was not then required. After he was put on half pay, he began practice in the immediate neighbourhood of this very distorted woman, and her first labour was the first midwifery case to which he was called. He obeyed the summons with reluctance, and on entering the patient's apartment, so far from approaching the bed-side willingly, he was, to use his own words, pushed towards it by the attendants. On introducing his hand under the bed-clothes, and advancing it to the vagina, he discovered a foot, whereupon he seized the extremity, and without any method whatever, dragged a living fœtus from the pelvis. He made a second examination and discovered the feet of another fœtus, which he disposed of in the same manner and with equal facility. Admitting that as the fœtus were twins they could not be large, neither could the mother's pelvis be very faulty, when a practitioner, utterly ignorant of midwifery, was enabled to conduct the delivery without method, and with so much facility.

The second case was that of a woman in her first labour, residing in Ponton Street, and attended by Mr Bruce, who, finding no advance of the fœtus after the first stage was completed, requested the assistance of the author, who, on discovering the brim to be contracted, proceeded to embrace the head with a lengthened pair of forceps. No progress, however, being perceptible after an hour's cautious exertion, the instrument was withdrawn and another trial given to the uterine efforts. After a delay of nine hours the head was perforated, and the fœtus extracted. This patient was so

well formed, tall, and elegant in her external appearance, that some of the profession could not refrain from expressing an opinion that the fœtus had been destroyed without due consideration. The author was solicited to attend this woman in her second labour, as she ascribed her misfortunes in her previous delivery to mismanagement on the part of Mr Bruce; but as she would not permit that gentleman to be present during delivery, the author declined attendance. One of those individuals was then called who thought that the perforator had been unnecessarily used in the first labour; but after affording every chance to the natural efforts to accomplish the delivery, and a consultation with a senior member of the profession, embryulcia was found to be indispensable; and in her third pregnancy, she was obliged to submit to the induction of premature labour.

Pelvimeters are of two kinds, the one to determine the external, the other the internal dimensions of the pelvis. The first was suggested by Baudelocque, it resembles callipers, is furnished with a scale of inches, and is intended to be applied to the pelvis externally; but however ingenious in theory, this contrivance is practically useless. A very obvious objection to it is, that though it might enable us to form a fair estimate of the pelvic dimensions externally, yet we should remain in utter ignorance of its internal conditions, as it might be very much vitiated by a distortion, or occupied by some morbid growth. *The internal pelvimeter* was suggested by Coutouli, and is no less objectionable than the external. It resembles the contrivance which shoemakers employ to measure the foot. From its application in a pelvis divested of the soft parts, a very high opinion might be formed of its utility; and taking the most favourable view of its objects, although it might be developed in the cavity and outlet of the pelvis in the living subject, and thus some estimate be obtained of their dimensions, yet it could not be advanced through the brim as it would be impeded by the head, and as it would unavoidably inflict injury on the structures by which this aperture is occupied. Indeed, I cannot bring my mind to think, however powerful the inducements might be to an unusually eligible matrimonial alliance, that there are many of our fair countrywomen, who are so utterly void of delicacy, that they could be prevailed on, previous to marriage, to undertake a confidential visit to an accoucheur to have their pelvis explored by a mechanical invention, to determine whether they could with safety become mothers. Nor do I find that such contrivances are much employed in France, the country to which

they owe their invention, though I believe the ladies there have no greater claims to delicacy of feeling than our own. Nor can I suffer myself to imagine that such of our own sex in this country at least, as would merely suggest the alleged proposal, would meet with any other than a negative, and that too in terms, I should expect, the most ungracious.

Since we can neither rely on the general appearance of the patient, nor on pelvimeters, the practitioner must be prepared for manual exploration. Without any very rigid investigation, considerable deficiencies may be detected by the ordinary examination. If, for example, in a woman of rachitic appearance or spinal distortion, the sacral promontory could be reached with facility, or be felt projecting unusually towards the pubes, if the sacrum seemed less concave than usual, the space between the tuberosities of the ischia obviously contracted, and the coccyx incurvated and immoveable, these conditions would be sufficient to justify the inference that a pelvis so constituted, though not one of extreme deformity, would however be of insufficient capacity to permit the safe transit of a living child.

In cases of extreme deformity three methods have been pursued in conducting this investigation: *First*, to place the root of the index finger in close contact with the lower part of the symphysis pubis, and advance its point to the sacral promontory. This plan however, is decidedly objectionable, because unless the pelvis were much vitiated, the top of the sacrum could not be reached, since in the generality of adult males, the forefinger rarely exceeds 2½ inches in length; *secondly*, admitting that the finger could reach from the promontory of the sacrum to the symphysis pubis, this line would be considerably longer than one from the promontory of the sacrum, in a direct line, to the upper part of the symphysis pubis, and would consequently convey but an erroneous estimate of the sacro-pubic diameter.

A second mode, and that in which I place most confidence, is to introduce the whole hand into the pelvis, and to advance its fingers through the brim—the little one being in contact with the pubes, and the index at the sacrum. If the whole four fingers cannot be passed, three, or two, are to be tried; and the sacro-pubic dimensions at the brim being determined according to this plan, the space between the ilia is to be ascertained in the same manner, and thereafter the capacity of the cavity, and the dimensions of the outlet. The fingers are now to be carefully measured, and in doing so due attention must be observed in taking their measurement at their summits and roots, and whether they had passed

through the brim to their centre, or merely to their first joints. Their size is now accurately to be ascertained, and if, from the result of the investigation, it be doubtful whether the perforator and crotchet could be used with safety to the parent, the examination should be repeated by other practitioners when their assistance can possibly be procured. Though this plan is unobjectionable in measuring the cavity and outlet, yet from the head or other presenting part resting on, or protruding to a certain extent through the brim before the patient has been visited, we might not be able to advance the hand, as directed, through the brim.

A third mode, when the preceding one cannot be adopted, is to introduce the index and middle fingers into the pelvis; place the point of the one in close contact with the symphysis pubis, and advance the other until it reach the promontory of the sacrum, or place one on each side of the head should it be somewhat protruded through the brim. The two fingers thus extended are to be withdrawn from the pelvis and the distance between them ascertained. To this plan it may be objected that however relaxed the vagina may be, it will be difficult if not impossible to retain the fingers in the exact position in which they were placed in the pelvis; but to obviate this, some body might be introduced betwixt them previously to their removal, and which would prevent their approximation until the distance between them were ascertained.

From the great difficulty of ascertaining the precise dimensions of the pelvis in the living subject, we ought, except when the deformity is extreme, to allow time for the parturient efforts to mould the head, if possible, to the passages, while the patient is to be carefully watched. After delaying the operation, in any case, so long as this shall appear prudent, though but an inconsiderable portion of the head should pass through the brim, yet the important advantages will be gained of enabling the practitioner to apply instruments with greater facility and safety, and of satisfying the friends that he has not destroyed life unnecessarily.

As to premature ossification, and consequent incompressibility of the bones of the cranium, with *increased volume* of it from *hydrocephalus* or *overgrowth*, when by prudent delay it has been ascertained that the passages are too confined to receive the head under these circumstances, embryulcia must be resorted to. It is proper to state, however, that crania containing a considerable quantity of water have been expelled by natural efforts, without any mutilation.

When the head, impacted in the pelvis, whether from mal-

position, or from tumefaction of the linings of this cavity, cannot be disengaged by the hand or forceps, embryotomy must be the next alternative. This operation will very frequently be required under the foregoing conditions; and it will now be necessary to consider other states, in which it occasionally becomes indispensable, or in which some practice is called for that involves the structures of the parent.

The descent of an enlarged ovary, or the occupation of some part of the pelvis by a tumour, may require embryulcia. If this latter be moveable, and the practitioner early in attendance, it should be pushed beyond the brim, and the fœtus brought down by the feet. But if the head has become impacted in consequence of the descent of the tumour, it becomes a question whether the parent would benefit most by its being punctured, extirpated, or by embryotomy. In every instance, where the swelling cannot be removed to make room for the head, it should be punctured from the vagina, by a trocar and canula, to diminish its volume. If it contain a fluid, this will be accomplished more or less perfectly. But if it be of a solid consistence, which we may suspect by the canula containing blood, fatty, or cheesy matter, and by the tumour not being thereafter reduced in size, its extirpation, *except when it possesses firm and extensive connections, and there is risk from hæmorrhage*, has been found a more successful practice than embryotomy. This latter, from the pressure and consequent suffering produced by the forcible extraction of the fœtus over parts more or less irritated, has proved a very unfavourable mode of proceeding. When an enlarged ovary constitutes the obstruction, it should be punctured at different points, in order the more effectually to evacuate its contents, which are often enclosed in distinct cells. Where, from its numerous attachments, and the risk of hæmorrhage, the excision of the morbid part would be injudicious, the earliest opportunity should be embraced to perform embryotomy, to avoid the injury that might arise from pressure.

If the extirpation of the tumour be resolved upon, the mode of accomplishing it must depend on its connection, and will readily suggest itself to any one possessing a correct knowledge of the relative position of the parts concerned. In whatever manner these cases be treated, the result is too frequently unfavourable; so that a guarded prognosis should always be made, both as to the mother and child. Of a table of 16 cases given by Dr Merriman in his Synopsis, in which the transit of the fœtus was impeded by an enlarged ovary, no more than one half of the women recovered, and only four of the children were saved.

Where the *os tincæ* has been impervious, its position may still be ascertained by the feel of a minute cicatrice, a depression betwixt slightly projecting lips, or a nipple-like protuberance. In these, as well as in cases where the first stage has been retarded in consequence of chronic inflammation, and scirrhus of the uterine aperture, incisions into the latter have been practised. I have now, as formerly stated, been twenty-seven years extensively engaged in obstetric practice, and though I have occasionally been concerned in such cases as those referred to, yet I have never met with an instance in which I entertained, for one moment, the necessity of making incisions into the os and cervix uteri, and I have never seen any woman die undelivered, nor for days afterwards, except those for whom my professional brethren had requested my assistance in cases of phthisis, uterine hæmorrhage, convulsions, or rupture of the uterus. I am the more particular in making this statement known, since I am aware how much the tyros and the inexperienced members of our profession are charmed with a bold practice, and that young and inexperienced teachers of the art, to acquire a reputation for fearlessness and activity, taking advantage of their position, have been known to adopt this practice, in cases where it should never have been thought of, and where those who had been the unfortunate dupes of those reckless proceedings, fell victims to their experiments.

In cases where the passage of the fœtus is impeded by the tardy dilatation of the vagina, from induration, partial or total occlusion of the canal at any point, and where copious venesection and prudent delay have not availed, the obstruction must be divided by a probe-pointed bistoury. The periodical press, and systematic works on midwifery, abound with cases in which this practice has been successful.

As an interesting and instructive illustration of the advantage of prudent delay, I am induced to add the following brief abstract of a case of first labour, in which, some few years since, a friend of mine was concerned. After contractions having been established some hours, and a lengthened examination per vaginam, no os uteri nor any other aperture could be discovered, except one scarcely sufficient to receive the point of a surgeon's probe. In these circumstances my friend deemed it imperative on him to make known to the relatives the unusual state of the organs. A senior practitioner was now named by the party for holding a consultation; and on his arrival, he not only corroborated the opinion previously delivered regarding the condition of the passage, but most unprofessionally and unfeelingly declared,

in the presence of the patient, that the only method of accomplishing delivery would be by cutting the child out of the womb through the side, which, as was natural to suppose, greatly alarmed the patient; that he did not undertake those great operations himself, but that he would return to town and come again with an operating surgeon, whose proceedings he would superintend. The consulting physician-accoucheur and operating surgeon took the precaution to dine before setting out to visit the patient, who resided a little distance from town, and it was fortunate for her they did so, for before their arrival she was safely delivered without any operation except venesection.

When the passages are so contracted that the pelvis cannot be examined in the ordinary manner, its exploration is to be accomplished *per rectum;* and where cohesion of the labia has occurred, we have no alternative. In these latter cases, when there is no *os externum*, and where the cranium has long pressed on the perinæum, an opening must be made, commencing about an inch nearer the anus, than the meatus urinarius, and the incision continued betwixt the labia pudendi, to within an inch and a half of the rectum. This opening will afterwards be gradually dilated by the pressure of the head; or it may be necessary, according to the strength of the patient, or urgent symptoms supervening, thereafter to have recourse to forceps or embryulcia.

Finally, it sometimes, owing to violent convulsions supervening during labour, becomes necessary to perform embryotomy, in cases in which, had delay been prudent, the delivery might eventually have been accomplished by the instrument of Lowder, or by forceps.

Sect. III.—*Embryotomy.*

When a case is met with by a young practitioner in which the painful alternative of mutilating the fœtus is unavoidable, he ought to have the sanction, if it can be obtained, of a man of experience, for performing the operation, to avoid being accused of precipitancy. The friends should be apprised of his intention; that the patient, owing to her formation, cannot bear a living infant, and that unless this operation be resorted to, she must sink under her sufferings undelivered.

Four instruments may be required for performing this operation, viz. Perforator, Kephalepsalis, Crotchet, and Forceps.

The *Perforator* resembles a pair of scissors, was originally

suggested by La Motte, and altered successively by the directions of Smellie and Denman. That with the suggestions of Dr Smellie is the most useful; it is a foot in length; each half terminates in a sharp point, which, for about an inch, has three cutting edges, that are bounded by stops or shoulders, to prevent the instrument passing beyond a certain distance through the bones. It should be strong, straight throughout, instead of being slightly curved at its extremity, as recommended by some practitioners, and which would only render it more liable to slip from the point with which it is in contact, in commencing perforation. The object of this contrivance is to make a breach in the cranium, that exit may be given to some of its contents, and that we may be enabled thereafter to remove successive portions of its bones, with a view to the reduction of its volume to the necessary extent.

The *Kephalepsalis* is an instrument of recent invention, having been, in 1842, formed after my suggestions, by Mr Simpson, an ingenious surgical instrument maker of this city. Its length is 13½ inches; that of the cutting part 2½ inches, and of the handle 11 inches. It is formed on the principle of scissors; but differs from them in so far, that instead of making a mere division, it effects a complete separation of the entire portion placed within its grasp. This is effected by continuing the outer blade round the extremity of the inner one, and returning it along the opposite sides as far as the joint or screw, where it forms one solid piece with the handle. When open, the blade resembles a box two inches in length, and half an inch in width, into which the inner blade is accurately fitted, and the cutting action is performed by the edges or corners of this blade passing those of the outer one into the box, as the handles approach each other. This invention is endowed with great power, can be used with very moderate exertion, acted with in a space of only an inch and one eighth in width, with perfect safety to the maternal structures, is capable of removing large portions of the skull in each successive application; while one or more portions of bone are still lodged within it, others may be cut away, and the whole simultaneously extracted by the instrument itself, thus superseding the use of the fingers, except to place the bone within its grasp. Thus a desideratum has been supplied, and a benefit conferred on instrumental midwifery, which must be universally acknowledged as one of the greatest advantage, not only in cases of extreme deformity, but even in those with slighter degrees of confinement, by superseding the tedious, painful process of tearing, twist-

ing, or wrenching successive portions of the cranium, and greatly diminishing the labours of the operator.

After the instrument is placed in contact with the cranium, its blades are to be separated, the one introduced within the breach, and the other applied upon the exterior of the cranium, without denudation of its integuments, which the instrument will readily divide; and its handles are now to be brought into as near contact as they will admit, when the part within its grasp will be detached with facility.

The *Crotchet* is a contrivance which, after the cranium has been reduced to the necessary extent, is employed upon the principle of an extractor. I employ one which was suggested by myself, and constructed under the directions of the same ingenious maker, to whom the profession are mainly indebted for the last instrument. It consists of two straight shafts, about $1\frac{2}{3}$ of an inch in circumference, united by a screw, moved on the principle of scissors, 14 inches in extreme length, of which the handles, shaped like those of forceps, form $6\frac{1}{2}$ inches. Each shaft terminates in an oval shaped blade, $2\frac{1}{4}$ inches in length and one in breadth; one of which is furnished with seven teeth, each half an inch in length—that placed at the extreme point of the blade being stronger than the rest, and slightly hook shaped; and the whole, when the blades are brought into opposition, are received into corresponding sockets in the opposite blade, which will prevent the object seized slipping from their grasp, and effectually shield the maternal structures from injury. This instrument, when once properly applied, cannot slip.

Forceps of about a foot in length, suggested by Dr Lyon, and called after his name, is the fourth instrument which I occasionally use in embryotomy. It will be found very serviceable for the removal of detached portions of bone, where the head has been perforated when in the brim of the pelvis, and cannot easily be reached by the fingers.

The different steps of this operation are very simple; the principal difficulty is, to determine its necessity. After the urinary bladder and rectum have been evacuated, the patient must assume the same position as in labour. The practitioner is now to place the index and middle fingers of the left hand in contact with the head; after which, the point of the perforator, guarded by the same fingers of the right, is to be carried into the vagina, and placed betwixt the points of the fingers already in the pelvis. In effecting a breach in the cranium, it has been advised to push the instrument through a suture or fontanelle; but in so doing, we should merely occasion a slight separation of

one bone from another, without fracturing them. The preferable plan by far, is to push the instrument through the centre of one of the parietal bones, by which we splinter it; and we have afterwards merely to remove the pieces. By this method we are also enabled to make a much larger opening in the skull. The position of the os uteri must be particularly attended to, lest any injury be done to it during the application of the perforator. When the latter is placed in contact with the scalp, it is to be pushed through by a steady boring motion, until its further advance is arrested by the stops. The handles are then to be separated, to enlarge the aperture which has been formed; after which, they are to be brought together, and again opened in a direction diametrically opposite to the first. To prevent the child affording signs of life when born, the brain and cerebellum should be effectually broken down, by advancing the perforator, and turning it repeatedly round within the cranium, when the instrument is to be withdrawn in the same cautious manner in which it was introduced. This is followed by a discharge of blood and brain, which should be concealed from the patient and attendants. If the head be not fixed in the brim when the perforator is applied, counter pressure must be made on the abdomen, to prevent the presenting part receding from the instrument.

The next part of the proceedings is to remove the loose portions of the fractured bones. If the head be well advanced in the pelvis, this is easiest effected by the fingers; but if the presenting part be high up, the forceps of Lyon will answer best.

We have now to determine the two following questions: *first*, whether to break down the cranium immediately after it has been opened; and, *secondly*, to what extent. In regard to the first query, if the patient has been much exhausted before the operation has been resolved upon, the pelvis much contracted, or if we have been compelled to open the head in consequence of swelling of the pelvic linings, an interval of from twelve to twenty hours should be allowed to elapse before the remaining steps are commenced. The integuments are in the mean time to be drawn over the aperture in the cranium to prevent the ragged edges of the fractured bone injuring the structures of the parent; who, during this delay, is to be carefully watched. To the late Dr Osborn, the profession are indebted for this excellent precept of leaving the fœtus for a certain period in the passage, by which time is afforded for the strength and spirits of the patient to be recruited, and for the fœtal bones to become

softened, whereby they are afterwards removed with less injury to the parent. If, on the contrary, the deformity be slight, and unaccompanied by exhaustion, or swelling of the linings of the pelvis, the extraction of the fœtus should be commenced on the return of pains. As to the second question, when embryulcia is performed in consequence of impaction, slight contraction of the pelvis, tumefaction of the soft parts, hydrocephalus, or convulsions, the mere opening of the head, and the degree of collapse consequent on the sanguineous effusion alone, or the escape of a small portion of brain, will enable us to effect its extraction without any further reduction. In occasional instances, though we may have succeeded in embracing the head with the forceps considered in Sect. II., Order Second of this class, yet owing to deficiency of space at a particular point, the fœtus cannot be advanced; but we are not on this account to withdraw the instrument, since after perforation, it will be found more useful than any other contrivance, not only in accomplishing the extraction, but also in diminishing the volume of the head by squeezing out the brain. When the pelvis, however, is greatly deformed, the cranium must be reduced to its very base by the kephalepsalis. Under the most favourable circumstances, even where the degree of pelvic deficiency scarcely prevents the application of forceps, the difficulty of accomplishing the extraction is very considerable; while, in cases of great deformity, the practitioner should be prepared for the most laborious exertions, and which, to his patient, will not always be free from risk. In these examples, the practitioner may have been exerting his whole strength for several successive hours, without being sensible that the presenting part has advanced in the slightest degree; but whenever it begins to yield, its extraction is afterwards effected with surprising expedition, considering the extreme difficulty encountered at the beginning.

Writers have very confidently offered directions regarding the mode of fixing the extracting instrument on various points of the cranium, as if it were easily effected; but the only object of the medical attendant is to apply the crotchet wherever he can procure a firm hold; and to ascertain whether it be securely fixed, the extracting force must at first be moderately exerted. In this part of the process the same rules are to be observed as in operating with forceps; *first*, if the head be in the brim, to extract in the axis of this opening; and, *secondly*, to draw down during a pain.

When, in a case of extreme deformity, the necessary time has been suffered to elapse after the head has been opened,

we proceed by means of the kephalepsalis to remove, in successive portions, the bones of the cranium, until it be reduced to the requisite extent. The upper part of the frontal and occipital, and nearly the whole of the parietal bones, may thus, by caution and perseverance, be brought away; and although those forming the face and base of the skull are much harder, yet the invention just named will also *easily* accomplish the reduction of the base, so that it will not be necessary, as was at one time recommended, to convert the case into a face presentation, with the root of the nose toward the pubes. If the transverse diameter of the brim measure an inch and three quarters, or, in the event of the fœtus being small and premature, an inch and a half; or if a practitioner not bred or accustomed to handicraft can pass through the brim the points of the fore, middle, and ring fingers side to side, transversely, from sacrum to pubes, thus making allowance for the additional space required by the crotchet, the extraction of the remainder of the fœtus is practicable, provided the lateral diameter of the brim amount to three inches; and provided also, the capacity of the outlet be commensurate with that of the superior aperture. It is to be acknowledged, however, that such an undertaking, though practicable, is any thing but safe; and that, though some *few* individuals may have survived the torture inseparable from embryotomy under such circumstances, a far greater number must have fallen victims to it; while the recovery of those who have been more fortunate may be ascribed, not to the utmost possible precautions which any human ingenuity could devise during the operation, but to a constitution unsusceptible of derangement except from extreme violence.

After the head is extracted, it is to be included in a towel, by which the requisite exertion is to be used to bring the body along. But when the pelvis is much confined, it may be necessary to open and eviscerate the thorax and the abdomen in succession, preparatory to the extraction of the body. The perforator must be employed to effect a breach in these cavities; we then fix within the grasp of the crotchet some portion of the nearest axilla to bring down the shoulder, and thereafter an arm, when the remainder will speedily follow. When the delivery is accomplished, the lacerated parts of the fœtus are to be neatly brought into apposition, the head stuffed, covered, and made to assume a proper form; and the whole body regularly attired, that it may be presented to the parent when she wishes it, without any injury to her feelings. The patient is then to be ordered a powerful dose of the sedative solution of opium, or of the solu-

tion of the muriate of morphia; and to obviate the injurious consequences which may be expected to result from the frequent introduction of instruments and the fingers, the external parts are to be constantly fomented for the first few days.

Having specified the smallest dimensions of the pelvis which will admit the transit of a living child, and also the extent of deformity which will require its mutilation, we have next to inquire, what is the greatest degree of confinement of the passages under which delivery by embryulcia may be attempted? Some of the most eminent practitioners of our country, as Drs Denman, Hull, and Burns, are of opinion, that unless we have a clear space of one inch and three quarters from sacrum to pubes, and of three inches from one ilium to the other, a fœtus come to maturity cannot, mutilated, be extracted with safety to the structures of the parent; but that if it be of dwarfish development, or premature and soft, one inch and a half transverse, by two and a half lateral diameter at the brim, will suffice. It has been asserted by Dr Osborn, however, that the operation is practicable under circumstances still less favourable than those just stated; and that he himself successfully performed it, where the dimensions were considerably smaller than those which the authorities already named have determined, as in the celebrated case of Elizabeth Sherwood. In her pelvis, from the promontory of the sacrum to the pubes, the space was thought to be only three quarters of an inch; from the promontory of the sacrum to the right ilium, rather more than two inches in length, and about one inch and three quarters in breadth at the widest point, for it could be but a small portion, after which the space became gradually narrower. Dr Osborn performed embryotomy in this woman; at the termination of thirty-six hours thereafter, alleged that he succeeded in dragging the mangled fœtus through the aperture just described; and that at the end of seven days, the patient felt as well as at any former period of her life.

It would be idle to enter largely on the refutation of this extraordinary case, since Dr Osborn's narrative of what he thought he had accomplished, is irreconcileable with common sense; for how could the base of the cranium, which is one inch and a half in thickness, and nearly three inches in breadth, be brought through the aperture which he describes? A fair estimate of the utter impossibility of effecting it, may be afforded by the simple experiment of forming, in a plate of hard wood, an opening in shape and size exactly corresponding to the pelvis of Sherwood, and attempting to force through it the base simply, divested of the other por-

tions of the skull. In Sherwood's case, notwithstanding the well known eminence of Dr Osborn as a practitioner, I am compelled to declare, from the foregoing facts, and the opinions of some of the most experienced men in the profession, that the extent of deformity in the pelvis of this woman, was most glaringly exaggerated. For, as the patient recovered, and as we are only furnished with its measurement in the living state, it cannot be considered as extremely accurate. Nor must I forget to mention, that the operator was most hostile to the Cæsarean section, which might have induced him to state the dimensions of this pelvis somewhat less than they would have been found had not the woman fortunately survived the operation, purely with a view to stimulate practitioners to greater efforts in cases of deformity, and thus prevent the section of the abdominal parietes being so frequently resorted to. It has also been stated, that the contraction which was discovered in this case, did not altogether arise from deformity, but partly also from swelling of the pelvic linings, in consequence of pressure;—but of all the explanations offered, this is the least probable. For, in performing the operation, Dr Osborn states, that an assistant was required to make counter-pressure on the abdomen, to prevent the head slipping away from the perforator,—a proof, if we are to believe any part of the statement, that the head had not entered the brim, until it had been dragged into it by the crotchet.

In commenting on this achievement of Dr Osborn's, I cannot pass unnoticed, an exploit equally marvellous, not only in my own, but also in the estimation of all my acquaintances, pretending to any knowledge of practical midwifery. I allude to a case published by Dr Robert Lee of London, in his recent work, styled Clinical Midwifery; in which, at page 73, he states that in a woman whom he delivered with the crotchet in five successive labours, "the tuberosities of the ischia were *not more than* 1½ *inch asunder;*" that on one of those occasions, when premature labour was induced at "7½ months, a superior extremity presented, and that *the operation of turning was performed* with great difficulty." This woman sank five days after her last delivery; and as, from our being informed that she died of uterine phlebitis, the inference must be that there was an examination of the body, it is most remarkable, however, that the dimensions of the pelvis are not stated. I am at a loss to understand, equally with every one to whom I have spoken on the subject, how *turning* could be effected in an individual with a *space of only* 1½ *inch betwixt the tuberosities* of the ischia,

except by the supposition that the hand of the operator was nearly as small as that of the fœtus which he extricated. But as the foregoing assertions are of too serious a nature to be made a subject for jesting, so irreconcileable with principles which are acted on by the most experienced practitioners in the operative department of midwifery, and from the position which Dr Lee occupies, are calculated to have a most mischievous tendency, I must take the liberty to tell him that he is bound to afford the professional public a more detailed account of the case referred to; as, until this be done, not only will the foregoing statements be doubted, but indeed considered as among the most extravagant assertions to be found in the literature of our profession.

As the kephalepsalis will remove every part of the cranium with great facility, our object now, before proceeding to perform embryulcia, is not to ascertain whether the dimensions of the pelvis be sufficient for the transit of the base of the skull, which could not formerly be cut away owing to its hardness, but the amount of space in which this instrument and the crotchet may be acted with. It has been stated that the kephalepsalis may be used when the space does not quite amount to $1\frac{1}{2}$ inch; but as, whenever it is introduced, the finger of the practitioner will be required to place successive portions of the skull within its grasp, I can conceive no reason for changing my opinion promulgated in the first edition of this work, and for many years inculcated in my lectures, that unless we have a clear space of two inches, or nearly so, in the transverse, and fully three in the lateral diameter of the brim, embryotomy must be abandoned, as not likely to ensure the safety of the parent. It may not probably be thought an inapplicable rule, and one which I shall certainly follow if I am ever called to such a case, viz. that when the fore, middle, and ring fingers cannot, in the manner formerly directed, be introduced through the brim, to consider such cases out of the range of embryotomy, for, in 99 of 100 instances, it will be found, that those three fingers, in persons who have neither been bred nor accustomed to hard labour, will not exceed two inches in thickness, by more than two lines, nor fall short of it to a greater extent, if their dimensions be taken across the centre of the second phalanx of the middle finger.

But if we consider how frequently it must be necessary to introduce and withdraw both instrument and finger, and during many hours of extracting efforts, the pain and injury to the parent, though embryotomy be practicable on such a space, yet the proceeding will require the most guarded prognosis.

The next point of investigation is, whether there exist so great a degree of deformity in females susceptible of impregnation, as to render embryulcia inapplicable? This inquiry need not detain us long, for every publication on midwifery offers cases of pregnant women, in whom the pelvic contraction surpassed what has been considered as safely manageable by embryulcia. Baudelocque mentions that he witnessed an instance where the space from sacrum to pubes was only from six to eight lines; Hull, where it was one inch and five-eighths; if Dr Osborn's statement is to be relied on, it was considerably less in Sherwood's pelvis; that of the woman on whom Mr John Bell operated in 1800, would scarcely admit the transit of a common marble between the projection of the sacrum and the symphysis pubis; Professor Nægelè of Heidelberg relates the case of a woman who was the mother of several children, and whose pelvis became so distorted from malacosteon, that on the left side, between the upper margin of the pubis and fourth lumbar vertebra, the space was only two lines, while on the right, it merely amounted to six; and there is a preparation in the Museum of the School of Medicine of Paris, nearly as deformed as that of the woman who was the subject of Mr Bell's operation. In the case related by Dr Haber, the pelvis is described as having been so obstructed by a large exostosis, that betwixt it and the posterior surface of the pubic bones, the small diameter of the opening at one point was only one line and a half. In the woman operated on for Cæsarean section, at Belfast, by Dr M'Kibbin, the space betwixt the point of the exostosis and the symphysis pubis, is only an inch and an eighth.

Sect. IV.—*Cæsarean Operation.*

When the pelvis is under the dimensions which will justify an attempt at delivery by embryotomy, the Cæsarean section is the next alternative. An opinion very generally prevails that this expedient was not resorted to until the sixteenth, but we find that the mode of performing it is described in the Chirurgia Guidonis, about the middle of the fourteenth century; and in the Mischnajoth of the Jews, which is the oldest book of this people, and supposed to have been published 140 years before the birth of our Saviour, or according to some, even antecedently to this period. In the Talmud of the Jews, also, their next book in point of antiquity, the Cæsarean operation is mentioned in such terms, as to render it extremely probable that it was

resorted to before the commencement of the Christian era. In the Mischnajoth there is the following passage: "In the case of twins, neither the first child which shall be brought into the world by the cut in the abdomen, nor the second, can receive the rights of primogeniture, either as regards the office of priest, or succession to property." In a publication called the Nidda, an Appendix to the Talmud, there is the following remarkable direction: "It is not necessary for women to observe the days of purification, after the removal of a child through the parietes of the abdomen." What stronger proofs can be required of the Cæsarean section having been more or less familiar to the public about the period in question, than these last passages; and how natural is the conclusion, that it had frequently been performed on the living subject with success; particularly when it is known, that in the same work there are several controversies as to the necessity of females, after delivery by this operation, observing the days of purification.

When we consider that Numa Pompilius, second sovereign of Rome, made a law forbidding the inhumation of females who died undelivered, until the fœtus had been removed from the uterus, it is not improbable that the operation is of greater antiquity than that stated in the Talmud. Admitting that it was resorted to about the earliest of the periods mentioned, its success, perhaps, was little better than has happened in our own times; and this may have led to its being relinquished for many centuries afterwards. We have no records that can be depended upon of its revival, until 1558,* when it was successfully performed at Sigenhausen by Alespachen, a German sow-gelder, on his own wife; but in her next labour, when the same mode of relief was proposed to her, she declared that she would rather die undelivered than submit to it. In the Hebraic works already referred to, we have also striking proofs that the operation was first done on one side of the abdomen, and not in the linea alba, as contended by Professor Osiander of Gottingen. To avoid the liver, the left side of the abdomen was first preferred; but afterwards, the right or left was chosen according to the position of the uterus, and supposed situation of the placenta.

The term Cæsarean is said to have been derived from the circumstance of Julius Cæsar having been the first who had been emancipated from the womb of his mother by this operation. Of this, however, there may be doubts; and even if it were correct that Aurelia had been the first to afford such proofs of resignation and heroism, it appears from the

* Bauhin, App. to Rousset.

writings of Suetonius that she survived the expedient; for she was living when the emperor undertook the invasion of Great Britain. But such a recovery, in times when the sciences of anatomy and surgery were so rude and imperfectly known, could scarcely be expected, nor is it at all probable that a Roman slave could have had the audacity to propose, more especially to one of the first patrician families of Rome, so desperate an alternative, particularly during ages of such despotism and tyranny. Pliny assures us that Scipio Africanus, the conqueror of Carthage, was the first; and Manlius the second, of the Romans who owed their lives to this operation; but he does not state whether their mothers survived it or not.

During the present and three preceding centuries, the Cæsarian section has been very frequently performed on the continent, and occasionally in Britain, where, comparatively speaking, it has been much less successful than in the former country, as may be seen in the Mem. Roy. Acad. Surg. of Paris, and in the translation of M. Baudelocque's Memoirs by Hull. In the former work is to be found an account by M. Simons, of sixty-four successful operations, the greater number of which were performed on thirteen women only; some of whom submitted to it five or six times, and one woman even seven times, with perfect success. It is stated in the latter work, that of 226 operated on in various parts of the continent, 136 recovered. Of late years, indeed, there are few numbers of the periodical press from the continent, which do not contain accounts of some successful case. In Britain, however, the result has been very different; for of about forty instances in which the Cæsarean operation was resorted to, in three individuals only has it proved successful; and two of these patients submitted to it under unfavourable circumstances. For the first, after having been several days in labour, was operated on by an ignorant midwife, who chose the right side of the linea alba as the seat of incision;* the second had also been suffering several days from uterine action before the operation was performed, but she enjoyed the advantage of being in the hands of an active and judicious practitioner, who preferred the left side of the abdomen; and moreover, her pelvis was vitiated, not by disease, but by fracture of its bones,† from which, however, she had perfectly recovered. Nor was Mr Knowle's case, the subject of the third successful operation, in the most favourable condition when it was resorted to, for the woman had been thirty hours in labour.‡

* Edin. Med. Essays, vol. vi. † Med. Rec. and Researches, vol. viii.
‡ Transac. Provinc. Med. and Surg. Assoc. v. iv.

At one time this mode of relief was thought to be indicated under such a variety of circumstances, that in the medical records of different countries, cases are to be found in which it was very unnecessarily resorted to, as it is to this day in some parts of the world, which must be allowed to have contributed to swell the list of victims. The operation for a long time, consequently, experienced a very ungracious reception both on the continent and in our own country. Parè, Mauriceau, and other eminent French practitioners, described it as embowelling a woman alive; while Ould styled it an illegal, barbarous piece of inhumanity, and declared the accounts of its success by Baudelocque, Simons, and other distinguished foreigners, to be quite fabulous. Dr Osborn was no less hostile to it, and asserted that it could seldom if ever be necessary. It was at one period, indeed, held in such abhorrence, that patients had been suffered to die undelivered, without any effectual step having been adopted for their relief; while on the other hand, some of the sex preferred being left to their fate, to submitting to what they were pleased to term a dangerous experiment.

Although the unfavourable opinion at one time entertained of this formidable expedient must have led to the most unhappy consequences, by deterring some individuals from operating in cases where the section of the abdominal parietes was justifiable, and thus losing valuable lives, yet this culpable inaction must in some instances have been beneficial, by preventing some of the profession resorting to it, where this mode of relief was not at all required. For, as has often happened among us, our continental brethren were infected with the rage for operating, and embraced every pretence and opportunity to perform this operation; and as it will immediately be seen, they certainly did resort to it unnecessarily. Both Gardien and Capuron advise it where the space betwixt sacrum and pubes measures two inches and a half, Parisian, an aperture through which it is not only possible to extract a mangled fœtus with safety to the parent, but through which an infant that had completed seven calender months *in utero*, might be extracted alive; for this amount of Parisian measure is nearly equal to three inches English. Even Baudelocque, one of the most conscientious practitioners of his time, performed it where the aperture was of this size. It is to be hoped, however, that in these realms, the superior morality of our profession is such, as to prevent the Cæsarean operation from ever being performed except in cases of indispensable necessity. Except the woman who was the subject of Dr Young's operation, I

cannot find another instance in this country, among those individuals who have submitted to it, in whom delivery could have been accomplished in any other manner.

The circumstances under which this formidable expedient is justifiable, are *first*, where the woman dies undelivered at any period after the conclusion of the seventh month of pregnancy; *secondly*, where the space in the short diameter of the brim will not admit the transit of three fingers in the position already described, no consequence whether the fœtus be dead or alive; *thirdly*, where, in a preternatural presentation, the pelvis is so confined, that it will not receive the hand of the practitioner to bring down the feet; but where, had the head presented, embryulcia might be performed with safety and effect; *fourthly*, in extra-uterine pregnancy; *fifthly*, in lacerations of the uterus; and *sixthly*, it becomes an important question, whether in cases of large tumours impeding delivery, the Cæsarean operation would not, in an individual otherwise of sound constitution, afford a better chance of prolonging her life than the removal of the tumour.

In regard to the first set of cases, it should be particularly remembered, that faintings of so intense a nature have sometimes been witnessed in pregnant females as to give them all the appearance of being dead; that in any case where the operation is resorted to, upon the supposition of life being extinct, it must, in every respect, be performed with the same degree of caution as if we were operating on the living, lest the woman might in reality be alive. Van Swieten and Baudelocque mention three cases, in which the Cæsarean operation was about to be performed, when the patients recovered from their state of torpor. Peu relates an instance, where, after he commenced his incision, the woman started up from her state of insensibility, with gnashing of teeth, and convulsive motions of the lips. Rigaudeaux speaks of a female who had lain apparently dead for two hours; and after the fœtus was removed by the feet *per vaginam*, animation returned. It is likewise proper to remember, that although the child generally dies first, yet that there are many instances on record where it continued to live for several hours after the life of the parent had become extinct, and where it was eventually saved by laying open the abdominal cavity. The princess of Schwartzenberg, who died in Paris after a burn, was a case of this nature; her infant was removed from the uterus alive, next morning. Gardien relates a case where the child was extracted alive, forty-eight hours after the death of the parent. But delivery ought not to be undertaken, either by this last method or

per *vias naturales*, unless there is strong evidence that the individual has been seven months pregnant, or nearly so, as we should only extract a dead fœtus, or one that must soon die.

Enough has already been said respecting the second and third variety of cases; and the fourth and fifth will be hereafter considered under other heads. In reference to the sixth cause, if a tumour be of an indurated, cartilaginous, or scirrhous nature, with extensive attachments, and occupying a considerable portion of the pelvis, so that its detachment could not be attempted without the life of the patient being involved by hæmorrhage, nor embryotomy performed without exerting such a degree of pressure on the morbid growth and other structures of the parent, as could not fail to be succeeded by inflammation and fatal consequences, I cannot help being of opinion, that the Cæsarean operation, in an individual otherwise of sound constitution, would be productive of results equally, if not more, gratifying, than any other line of practice. For by it, when resorted to under favourable circumstances, we can ensure the preservation of one, if not of both lives. This operation, however, is of so formidable a character, and has been so frequently fatal in its results, that it is to be hoped, it will not be chosen under any other consideration, than dire necessity.

From the far greater success of this expedient on the continent than in Britain, I am naturally led into a brief investigation of the circumstances under which it has been performed in both countries. In the *first* place, it is proper to remark, that in this country the operation, with few exceptions, has been performed on subjects in a very unfavourable condition, from their being reduced by disease, malacosteon, and other affections, to so great a degree as to be capable of themselves, in a little time, without any operation, of proving fatal to the patient. *Secondly*, it must also be noticed, that many of the individuals who were operated on in this kingdom, were permitted to be a considerable time in labour before this mode of relief was adopted, whence they must have been rendered unfit to undergo so formidable an operation. *Thirdly*, it is probable that the stimulating regimen so frequently indulged in by the community of this country, has contributed in no small degree to swell the list of fatal cases. And *fourthly*, except the woman operated on by Professor Young, I am not aware of another instance, as already stated, where, in this kingdom, the Cæsarean operation has been performed without its indispensability, by the most careful examinations, having been previously established.

On the continent, the operation has been performed under

very different circumstances. In the *first* place, it will be seen in Levrèt and Baudelocque, more especially the memoirs of the latter on this subject, that the section of the abdominal parietes has been very frequently resorted to by continental practitioners, in cases, decidedly, in which it was not required, and on patients, it is to be presumed, enjoying a very different state of health to that of those who were the subject of operation in this country. Levrèt recommended it in every instance in which the hand could not be introduced to bring down the feet; Baudelocque, as already mentioned, by the advice of Cigault, operated on two females in whose pelves there was a space of two inches and a half in the short diameter of the brim; and there are many examples related in Baudelocque's Memoirs where it was done under circumstances equally unwarrantable, in reference to space. *Secondly*, it is to be apprehended, that on the continent the operation is seldom so long delayed as it has so frequently been in Britain; for there is neither that dread of operating so generally entertained by British practitioners, nor that high estimate of human life. *Thirdly*, it must be well known, that the mode of living among the community on the continent is so simple, or rather so poor, compared to that of people in this country, that it is probable this alone would tend to render the results of the operation more salutary than among females in Britain. *Fourthly*, the frequent yet successful repetition of the operation on the same female must render somewhat suspicious, the reports of the numerous recoveries said to have taken place after it.

No point connected with this measure is more certain than that its frequent fatality, in Britain at least, may be ascribed to timidity and delay, together with the very unfavourable state of health of the patients when operated on; and in support of this opinion, the following irresistible facts may be adduced: *first*, the recovery of individuals who operated on themselves;* *secondly*, the successful issue of those cases in which the sow-gelder and the midwife had operated; *thirdly*, the recovery of females after the laceration of the abdominal and uterine parietes by ferocious animals or otherwise;† and

* In the sixth and seventh vols. Lond. Med. Jour. a case is related by Sir E. Home, in which a woman of colour successfully operated on herself; and so little did she apparently suffer from the operation, that it was found necessary to watch her in her after labours, to prevent her repeating the same act. In Mosely's work on Tropical Climates, is detailed the case, also of a woman of colour, who operated successfully on herself. And in the New York Med. Phys. Jour. for 1823, will be found another successful case, exactly similar to the above.

† In Hull's Translation of Baudelocque's Memoirs on the Cæsarean operation, will be found two cases of recovery after laceration of the uterine and ab-

fourthly, the complete re-establishment of health, after the abdominal cavity had been extensively laid open for the removal of large ovarian tumours.

In regard to the prognosis, this should in every instance be guarded, but at once unfavourable in all individuals suffering from mollities ossium, as also where a female has been long in labour before the operation was performed. When the patient is known to be very apprehensive as to the event of the operation, the prognosis must be doubtful; and it should be so also in those who have been accustomed to indulge in opium, stimuli, or the luxuries of the table in any form; and in this list we may likewise include females of a full robust habit of body.

The better the health and spirits, the more trivial the deformity, and the more simple the habits of the patient have been, previously to the operation, the less danger is to be apprehended. I am satisfied that the greater success of the operation by our continental brethren, admitting the accuracy of their reports, compared to the results in our own country, is mainly to be attributed to the simpler habits and less irritable state of the system—an inference of which we have a strong corroboration, *first*, in the recovery of females almost in a state of nature, who had either operated on themselves, or had the operation performed on them by ignorant persons; and *secondly*, in the fearful mutilations which, for the sake of experiments, have been practised with impunity on some of the lower animals, more especially rabbits, which are very delicate creatures. Dr Churchill, in his elaborate statistics of this operation, observes the average mortality of foreign cases to be, one successful to $2\frac{1}{3}$ unsuccessful; or to 217 mothers who recovered, 152 died; and of 187 instances where the result to the child is given, 49 were lost. In these statistics it is likewise stated that of 40 operations by British practitioners, 11 mothers recovered; but in this last statement there must be some error, as I am not acquainted with more than three successful instances in this empire; for I would not include either American cases, or those of extra-uterine fœtation.

Notwithstanding the fatality of this expedient, it is not difficult to perform; and from the recoveries which have taken place where extremely ignorant persons have operated,

dominal parietes, and the extraction of the fœtus by the wound which had been inflicted by a bullock's horn. A case followed by recovery, is communicated in 13th vol. Edin. Med. Comment. by Dr Farquharson, in which, from violent efforts during labour, the abdominal and uterine parietes were burst, and the fœtus ejected through the wound.

it may be presumed, that presence of mind is more necessary than transcendant talents. It must, indeed, be so appalling in its appearance, that no one should attempt it unless he is previously convinced that he possesses sufficient resolution and fortitude to accomplish it with dexterity.

Whenever it has been determined by two or more experienced practitioners that the degree of confinement of the pelvis is such as to demand this mode of delivery, there should be no farther procrastination than what is required to communicate to the friends the necessity for such a step, and to prepare the mind of the sufferer. The bladder and rectum are to be emptied if necessary; the temperature of the apartment elevated to the 75° of Farh.; and immediately before the operation is commenced, the membranes of the ovum be ruptured, and the liquor amnii evacuated, to prevent its escape into the abdominal cavity after the uterine incision. A firm hair mattress placed on a table of the proper height, will constitute the best couch for the patient.

In regard to the line of incision, it is now proved beyond a doubt, by the researches of Dr Mansfeld into the writings of the ancient Jews, that long before the opening was made in the linea alba, it was customary to prefer either side of the abdomen. Varoquier was the first who proposed, and Guenin the first who performed, the Cæsarean section in the linea alba. Monro secundus gave the preference to this last point; but others have recommended the external incision to be made transversely or obliquely, relatively to the abdomen. By dividing the parietes in the linea alba, though we should avoid the epigastric artery, yet we should destroy the central union of the lateral abdominal muscles, and thus permanently perhaps, diminish that protection and support which these walls afford to the subjacent viscera. The oblique and transverse incisions are still more objectionable, since by adopting either we should not only divide the epigastric artery, but also the greater part of the muscular fibres on one or both sides of the abdomen, in such a manner as to render their subsequent approximation difficult, owing to the retraction consequent on their division. Either side of the abdomen, parallel with, but not in the linea alba, seems the best situation for the external cut. It should be commenced about two inches above the umbilicus, and one inch towards that side of it on which the bulk of the fœtus is chiefly placed; and it should extend from six to seven inches in length. It has been recommended, for the sake of uniformity, previously to trace out the line of incision with ink, but such a precaution could not fail to intimidate

the patient, and would be altogether unnecessary to a cool operator.

The patient being well secured by assistants, and every minor step settled, the practitioner should begin his incision at the point mentioned, carrying the knife through the integuments, and tendinous expansion of the abdomen, and betwixt the fibres of the rectus, along its inner margin. After incising the abdominal parietes to the necessary extent, and cautiously exposing the peritonæum, a fold of the latter must be pinched up, and the membrane laid open to a length corresponding to that of the external wound. When this last step has been accomplished, the patient coughs, and the intestines rush out profusely. In most works, we are earnestly directed to prevent their escape; but even were we able to effect this object, more injury than benefit would result from the efforts required: they should therefore be permitted to protrude freely, but must in the mean time be enveloped in a succession of soft towels, wrung out of warm water. By following this line of incision, we avoid the epigastric artery, as also muscular fibres, except a few of those of the rectus. Betwixt this muscle and its fellow of the opposite side, there is now at the centre of the abdomen, a considerable separation, in consequence of the distention of this cavity. And by leaving the linea alba untouched, the integrity of the central union of the abdominal parietes is preserved.

I come now to describe the most anxious part of the practitioner's duty, viz. the uterine incision; I say most anxious, for he must incise the uterus, and avoid, in so doing, the attachment of the placenta; yet, after every caution, he may cut through that part to which the mass adheres, and thus with one stroke of the knife, not only destroy the life of the parent, but also bring that of the fœtus into jeopardy. The direction of this incision, and its situation *in utero*, have been variously advised—obliquely, transversely, and longitudinally,—in the centre of the uterus, toward either side of it, or chiefly in its cervix. Of all these directions and situations, the longitudinal cut, and the centre of the cervix uteri, are the best; for here we avoid the round and broad ligaments, the fallopian tubes; very probably the placenta; and the part is less muscular and vascular than either the fundus or body of the uterus. In order not to injure the placenta, it has been advised by Sir Charles Bell to make but a small opening in the uterus, and to dilate this afterwards to the necessary extent by the fingers; but to say the least of it, this is a proposal as absurd as any that is to be found in professional works; since, by the knife, this may be

effected in a few seconds, while by the fingers it would require many hours. Besides, such protracted exposure of the viscera would be no less hurtful to the patient than the operation.

In effecting the section of the uterus, it is of the first importance to avoid both the placenta and the fœtus; but as some of the most eminent practitioners have fallen into the former error, I presume it must be difficult to determine the situation of the mass. As I have myself performed this operation, only with the view of saving the fœtus, any directions that I may offer regarding it, may be considered as the result of reflection on the cases operated on by others. In the dead body, it is most difficult to determine the position of the placenta; but comparatively speaking it is easier in the living subject by the stethoscope. As the seat of incision we should prefer the side of the uterus diametrically opposite to that in which the feet of the fœtus are situated. At this place, a probe-pointed bistoury is to be cautiously carried through the womb, and the parietes divided, on the finger, to the extent of five inches, limiting the incision as much as possible to the cervix.

In the Edin. Med. Surg. Journal, for October 1826, a case is related by Dr Meyer of Minden, wherein he cut through the placenta to the extent of an inch and a half in performing the Cæsarean section, and we are informed that there was very little hæmorrhage. And Dr Mansfeld of Brunswick states, that he never heard of death from this cause. I am at a loss to reconcile these assertions with what occurred in the practice of Baudelocque and others, on whose experience perfect reliance may be placed. All that can be said is, that the researches of this last writer have been but limited, for Baudelocque details an instance in which the placenta was divided in passing the knife through the uterine parietes, and the patient died; John Bell, who was the greatest surgeon of the age, experienced a similar misfortune, and his patient died in an hour after the operation; and Siebold, a third who was equally unfortunate. I can easily believe, that if that margin of the placenta, the most distant from the insertion of the funis, were divided, and the uterus to contract kindly, very little hæmorrhage would occur; but I am equally satisfied, that were the knife to pass into the uterus, either through the centre of the mass, or through that part of it into which the funis is inserted, that in consequence of the vessels being large and numerous at these points, the effusion would not only prove fatal to the patient, but most probably also to the child. Sir Charles Bell was

present on the occasion of his brother Mr John Bell operating, and whenever he saw some of the lobes of the placenta protruding the uterine incision, he pronounced that the case would have a fatal termination.

When the section of the womb is completed, the fœtus should be extracted head foremost, lest by the uterus, as occasionally happens, powerfully contracting on it and around the neck, respiration might be prevented and the child destroyed. If, on the other hand, the breech were first extracted as many recommend, the placenta might be detached before the head could be disengaged, and the fœtus would thus also be lost, not only in consequence of the atmospheric air being excluded from the lungs, but from the utero-placental connection being destroyed.* After the fœtus has been removed, the practitioner should pass two fingers from the uterus into the upper part of the vagina, that on detaching the placenta, any effusion resulting from it may have a free exit. Generally, the uterus contracts rapidly after the extraction of the fœtus, even in the case of a person recently deceased, as I have several times witnessed, that in a minute the organ was as much reduced, as it usually is in a healthy living female shortly after parturition. The placenta should now also be detached and extracted. It is rarely necessary to apply pressure to the uterus to effect the detachment of the mass. When it has been evacuated, three ligatures should be placed in the lips of the incision, to prevent a portion of intestine passing into the womb, as happened in one of Baudelocque's cases, which proved fatal, apparently from strangulation of the gut. The operation being thus far completed, the viscera are to be returned into the abdominal cavity, and we are to observe that the uterus be in a state of con-

* Mr K. Wood seized the child by one thigh, and the body was extracted with the greatest ease, until the shoulders came to pass, when the uterus suddenly and powerfully contracted, and grasped the child's neck and left arm so strongly, that this gentleman could not liberate it, although he used great force in extraction. He then gradually passed his hand along the body of the child into the uterus, and having dilated the stricture, the child was extracted. It would have been easier to have torn away the uterus from its connections, than to have brought the child away by direct extractive force. The fundus and body of the uterus felt very hard. The child was vigorously alive when first taken hold of, but, from the length of time occupied in extracting the head, it became so enfeebled as to show only slight signs of life. I very diligently employed every means to resuscitate it, and continued them for at least three-quarters of an hour, but was ultimately unsuccessful. This was a most appalling affair. After dividing the funis, the placental extremity was firmly held with one hand, whilst the other was introduced into the cavity of the uterus, for the purpose of removing the placenta, *which was already detached, and lying loose.* The uterus then immediately fully contracted.—*Edinburgh Medical and Surgical Journal, No.* 146.

traction, to remove every apprehension as to the liability of hæmorrhage. In a stout vigorous patient, however, effusion to the amount of sixteen or twenty ounces would be rather favourable than otherwise.

The edges of the abdominal incision are now to be brought into apposition, and so retained by five ligatures, which should include a considerable portion of structure, to prevent their being disengaged by ulceration, before the margins of the wound have cohered. We are further to support the apposition of the parietes by strips of adhesive plaster, on the top of which some lint and tow are to be placed; and the whole afterwards secured by something in the form of the common binder placed round the abdomen; after which the woman should be carefully lifted into bed.

The operation being finished, the patient should have three grains of solid opium to allay irritation, and one grain every alternate hour afterwards, should uneasiness be complained of. When that collapse of the system, consequent on great operations, is replaced by excitement or reaction, the individual must be bled to the extent of making a *moderate* impression on the pulse. A rigid antiphlogistic regimen is to be observed, until complete cicatrization of the wound shall have taken place. The dressings are not to be removed for the first three days, but they should afterwards be changed daily. Accumulations in the rectum are to be exonerated by an occasional domestic enema, and the use of the bed-pan; and the bladder is to be evacuated by the catheter.

Finally, if deformity, to the extent of requiring the Cæsarean operation, does exist, the individual should be put on low diet for a month or six weeks before she expects to be confined; and she should be cautioned against every thing calculated to excite mental emotion.

Sect. V.—*Cigaultean Operation.*

The use of the crotchet being dangerous to the parent, and always destructive to the fœtus, and the Cæsarean operation having been so frequently fatal to the former, the profession were naturally anxious to discover some method of alleviating the distresses of the sex, or of securing them altogether from those dangerous operations. Many of the most industrious cultivators of the art, seeing that their efforts were unavailing, ultimately became tired of the search, and contented themselves with deploring miseries which could not be averted. Those unsuccessful inquiries, how-

ever did not deter the French, always so remarkable for enterprizing ingenuity, from proposing a new expedient far less formidable to appearance than the Cæsarean section, and which at first was supposed to be much less dangerous, and calculated to supersede the operations already described. This was no other than the section of the pubes, an operation which has been named after the individual, Monsieur Cigault, who first proposed as well as performed it.

When it was recommended to the public, M. Cigault was a mere tyro in physic, studying at the College of Angers, in 1773. He wrote a Thesis on this subject, entitled, "*An in partu, propter augustian pelvis, impossibili, symphysis ossium pubis secanda.*" Although he was the first who published a description of the operation, the idea of enlarging the cavity of the pelvis in cases of deformity did not originate with him, but with a M. Pineau, who lived 200 years previously; and who was satisfied with modestly recommending the application of such substances as he supposed might tend to relax the pubic symphysis, and thereby facilitate the transit of the fœtus. Hence it may be inferred, that Cigault derived his first notions of the pubic section from the suggestions of Pineau; who again probably imbibed the idea from the ancients, who were aware that the various pelvic symphyses be came relaxed about the time of parturition, Whether practitioners were not sufficiently daring to undertake this new operation, or that they viewed it as one of those rash speculations of the untutored mind, cannot now be determined; but, be this as it may, it was not practised until 1777, when M. Cigault, assisted by M. Roy, performed it successfully, preserving both mother and child. The accounts of the operation were received with unparalleled applause; no discovery in the science was more universally lauded; it had almost as many partisans as there were individuals acquainted with it; many physicians and surgeons on the continent and elsewhere declared in its favour, even before the event could be known; and all Europe resounded with the praises of the operators. Great honours were conferred on them by the community of Paris; they were both introduced to Louis XV., who ordered a pension not only for each of them, but also for the patient, from the representations, by some of the profession, that the operation would tend to save many lives which would otherwise be sacrificed by the Cæsarean section. The faculty of Paris ordered a gold medal to be struck, to commemorate the occasion. The enthusiasm was not confined to the capital, but extended over France. Every opportunity was embraced to extol the practice, then only sup-

ported by a solitary case; and such was the influence of this eulogy, that many females were prevailed upon to submit to it, who either could not be relieved by its means, or might be delivered of living children without any operation. This mania, however, did not long continue; and singular as it may seem, the very inventor of the operation lived to disapprove of it himself; for on two different occasions on which he was consulted by Baudelocque, shortly before his death, he in both instances recommended the Cæsarean section, in preference to that for which he himself had been so singularly favoured and rewarded.

The merits of this expedient were early examined in Britain, where, from experiments on the dead subject, it was satisfactorily proved, except to a few, that its adoption could not be defended on any just principle. On dividing the symphysis pubis, the bones recede half an inch spontaneously; but the short diameter of the brim cannot be enlarged more than one inch, unless they separate three inches; and we find that this separation cannot be carried beyond one inch, without producing laceration of the sacro-iliac symphysis, which has always been succeeded by violent inflammation, and the death of the patient. Admitting, then, that the brim cannot be enlarged beyond the third of an inch by this operation, without lacerating the sacro-iliac symphysis, and destroying the patient, it follows, that the pubic section cannot enable an ordinary sized fœtus, when come to maturity, to pass alive, unless the superior aperture measure, before the operation, at least three inches and a third, in its short diameter. And as, in many cases, an opening of such dimensions would admit the application of forceps, or the transit of the fœtus naturally, it is evident, that this expedient is not only useless, but that it has been resorted to without due reflection, and has been suggested by a mania for operation, incompatible with humanity. Even in a pelvis of three inches and a third, in the short diameter of the brim, we could not certainly calculate, by the section of the pubes, on saving the life of the fœtus, since we are unacquainted with any method of determining the exact size of the head and of the pelvis in the living state.

From the foregoing observations, it is obvious that the Cigaultean cannot supersede the Cæsarean operation; and though less formidable, it will be seen, from a history of the cases in which the pubes was divided, and which Baudelocque has faithfully collected, that it has been much less salutary in its effects, than the section of the abdominal parietes. For, of thirty-six individuals operated on, fourteen died, and

eighteen children were still-born; so that every operation but four had its victim. Many of the females who recovered, continued to labour under permanent dissolution of the pubic joint, followed by lameness, sloughing of the soft parts, exfoliation of the bones, incontinence of urine, and prolapsus of the uterus and vagina. Another painful fact, showing how little the welfare of those concerned had been consulted, is, that in nine of the cases, the patients had afterwards living children without any operation. Much to the credit of British practitioners, they have only once performed it, and both mother and child perished. As this expedient simply consists in the separation of the pubic bones at their simphysis, and as it is now scarcely ever performed, I shall not occupy the time of the reader with its formal description.

Sect. VI.—*Induction of Premature Labour.*

In 1756 this was proposed and practised by Dr Macauley of London, as a salutary resource for those females who, in consequence of deformed pelvis, could not bear children alive, at the natural term. Like other improvements in science, the practice had long to struggle with the superstition of the times; but the happy consequences which resulted from the earliest attempts, speedily removed the prejudices against it, and brought it into general notice. When, in a female with deformed pelvis, a breech presentation is known to exist, this should farther induce us to procure the premature evacuation of the uterine contents; since, were the fœtus in this position suffered to remain in utero, until gestation were completed, the perforator would be useless, and the section of the abdominal parietes would then be indispensible; whereas, had the head instead of the breech been placed at the brim of the pelvis, the space might be adequate to the removal of a mangled child, with safety to the parent.

The induction of premature labour has proved a salutary resource under several other circumstances, besides diminished capacity of the pelvis. In pregnancy, during the early months, where there is so great a degree of irritability of stomach, as to lead to apprehension that the patient might sink from inanition, owing to her inability to retain nourishment, this expedient may be required; as also in those women who are frequently threatened with convulsions. Dr Denman speaks of individual females who came under his notice, in whom the fœtus always died in utero, at a certain period of gestation, and in whom, by inducing labour ante-

cedently to that particular time, he succeeded oftener than once, in preserving the life of the infant.

From all I have heard or read, and from what my own experience has taught me, I can say that the practice is safe. But when any formidable disease exists, which cannot be relieved by premature labour being induced, or aggravated by suffering gestation to proceed, a practitioner must be cautious in resorting to it.

Though by this operation we secure the parent from being obliged to submit to the Cæsarean section, or the use of the perforator, yet we cannot in any instance predict its results, in so far as the child is concerned; *first*, because we are unable, in the living state, to determine the actual dimensions of the pelvis; *secondly*, because we cannot estimate the size of the fœtal head, which, even in the progeny of the same parent, may vary in every one of a given number of infants; and *thirdly*, because we cannot always fix the date of conception. Unless the pelvis be so capacious as to admit, without long continued pressure, the transit of an infant that has completed seven kalender months *in utero*, premature labour can be useful to the parent only, for the fœtus is rarely reared when born prior to this date.

It comes to be a question, then, what are the smallest dimensions of the pelvis that would justify us in allowing gestation to advance to the close of the seventh month, or to such a period as to render it probable that the infant might support an independent life. In this we must be regulated by the extent of confinement of the pelvis. At the close of the seventh month, the parietal diameter of the cranium, measures two inches and three quarters; and in the early half of the eighth, it amounts to three inches. It may be presumed, therefore, that if the superior aperture present a space of three inches, or nearly so, in its short diameter; or if a practitioner, whose fingers do not exceed the usual dimensions in thickness, can insinuate, side to side, the four fingers through the short diameter of the brim, until the point of the little one be on a level with the linea pectinea, the fœtus may be allowed to remain *in utero* until the beginning of the eighth month, and uterine action may then be induced with every prospect of success; provided always, however, that the space at the *outlet* be sufficient. In an individual accustomed to produce large children, the induction of premature labour is justifiable even though the short diameter of the brim amount to three inches.

In the introduction of the hand to determine the capacity

of the brim, the patient must be cautioned against straining, lest the membranes might be ruptured, and the fœtus be thereafter exposed to the contractions of the uterus, which have too frequently led to its destruction.

Several modes of practice have been recommended to induce premature uterine action; *first*, To rupture the membranes; *secondly*, To separate them by the finger, to some little extent from the substance of the uterus; *thirdly*, To excite the uterus by ergot; and, *fourthly*, To place a piece of spunge, or a ball of surgeon's lint, in contact with the os uteri, where it should be permitted to remain, or occasionally withdrawn and replaced, until contractions be excited. To the *first* I object for reasons just explained; I can say that the *second* will not always succeed, owing to the insusceptibility of the uterus to be excited into action; the *third* I consider most improper, as it occasionally leads to the destruction of the fœtus; but to the *fourth* I see no reasonable objection, except that it is not easily applied. By far the safest, and most effectual method of inducing labour pains, is by a male catheter of the largest bore, with its curve slightly diminished, introduced so far within the *os uteri*, as to effect a detachment of the membranes to the extent of from two to three inches, which is to be accomplished by a circular motion of the instrument, carried completely round between the ovum and the uterine parietes. The organ is sometimes so insusceptible to excitement, as not only to require the repeated use of the catheter, at intervals of two or three days, but even the rupture of the membranes.

Sometimes the uterine aperture and cervix are slightly dilated, when it becomes necessary to perform this operation; but at other times they are almost impervious, and require to be cautiously distended, that the finger or catheter may be introduced to detach the membranes. When the os uteri can be commanded by the finger, which however can rarely, if ever, happen, this will constitute the safest method; but when it cannot, the catheter is to be conducted toward the uterus, and cautiously introduced within it. In from three to six days after this proceeding, labour pains come on; and while the process is advancing, if the presentation be natural, we must carefully avoid rupturing the membranes, until the head is on the eve of being excluded from the vagina, as the presence of the liquor amnii will preserve the fœtus from injurious pressure.

To accelerate the establishment of uterine action after the detachment of the membranes, the patient should be ordered a dose of some cathartic medicine every alternate day, and a

ride or walk daily. Before the operation is commenced, the practitioner should insist on a wet-nurse being in readiness to give nourishment to the child, as it has often been known to perish from a neglect of this precaution. Infants born prematurely should be carefully attended to in point of warmth; and have suck frequently, but little at a time: under the best management, however, they are reared with difficulty, and many of them perish during dentition, or the exanthemata.

When the short diameter of the brim is considerably under three inches, it would be vain to expect that a fœtus could be born alive, capable of being reared, as labour must be induced at a much earlier period than that already directed. After the uterus begins to act, the patient must be watched to prevent her suffering from hæmorrhage; and if, from the degree of deformity, the fœtus and secundines are long detained after the detachment of the latter, the passages are to be preserved free from putrid matter, by injecting once in four or five hours, from six to eight ounces of a decoction of oak-bark, or of Anthem Nobilis in a tepid state, until the uterine contents be dislodged.

As under such circumstances, we might frequently be obliged to destroy the fœtus, it becomes a question, not necessarily subject to our decision, how far it would be proper for females of this character to abstain altogether from the conjugal embraces. That they should so abstain does not admit of a doubt, as being a minor hardship than that of submitting to the removal of the ovaria, or fimbriated extremity of the Fallopian tubes, as has of late years been suggested; and being, in a moral point of view, much less painful than the frequent destruction of the fœtus.

CHAPTER IV.

OF PRETERNATURAL LABOURS.

In this class may be included presentations of every region of the body, except those of the head and funis; and though the latter will be considered in the next chapter, yet they occasionally require the same management with some of those which are now to be noticed. Various signs supposed to indicate the presence of preternatural presentations, have been mentioned; as, something unusual in the shape of the abdominal tumour, or in the movements of the fœtus, and several sensations of which the individual had not been sen-

sible in her former pregnancies; but too frequently these have their origin in mental anxiety, and we are rarely acquainted with the position of the child until labour supervenes.

We are almost ignorant of the causes which conduce to presentations of this nature. Accidental circumstances, though at one time supposed to give rise to them, seem to have little influence; since females who have been upset in carts and carriages, generally afterwards give birth to infants in a natural position; because the fœtus is pretty closely embraced by the uterus, and the latter by the abdominal parietes. After the length of the fœtus therefore exceeds the lateral diameter of the uterus, and which will generally happen in the seventh month of gestation, a change of position cannot readily take place unless the fœtus be smaller than usual, or the liquor amnii profuse. We often observe in the same female a succession of preternatural births: in three individuals it happened three times in our practice, and twice in a fourth. Besides a superabundance of liquor amnii and diminutive size, morbid enlargement of some abdominal viscus may dispose to malposition of the fœtus, and when uterine action is strong, and labour comes on prematurely, it is more readily thrown into a preternatural attitude. As all the cases of this class are treated in one of two ways, they may be conveniently divided into two orders, according to the respective management of each. Next to the head, the breech is the part most frequently found in advance; the knees and feet are not original presentations, but are to be considered, generally speaking, as changes of which breech cases are susceptible, after the membranes have been ruptured. When, in labours of this kind, an early opportunity is afforded of making an examination, the fœtus is found in a sedentary position.

Order I.

Sect. I.—*Feet Presentation.*

These are distinguished by the shortness of the toes, and by the prominences of the heels and ankles,—points in which they differ widely from hand presentations. Both the lower extremities are generally advanced together, but sometimes one of them is doubled upon the body, and retained; and since here the degree of extracting force employed must be entirely expended on the protruded limb, the delivery requires to be conducted with caution.

In *a first labour* of this order, venesection should be pre-

mised to relax the passages, and facilitate the extraction of the head; and under ordinary circumstances, all interference tending to accelerate the advance of the fœtus must be avoided, until uterine dilatation has attained its *acme*. When a woman has had a family, the membranes should be ruptured when the dilatation is about two inches in diameter; after which the feet are to be grasped above the ankles by the fore and middle fingers of the practitioner, and brought into the vagina. We now permit the delivery to be advanced by the natural efforts until the feet come upon the perinæum, when they are to be disengaged from the os externum, and enveloped in a soft warm napkin. As the feet reach the vulva, the transit of the breech through the brim commences, with one tuber ischii toward either side of the pelvis anteriorly, and the other at the opposite side posteriorly. During every contraction, the limbs are now to be drawn down by a gentle, pendulous movement, until the knees protrude externally.

The position of the toes must now be particularly attended to; if they point to the pubes or sacrum, the thighs, enveloped in the napkin, are to be grasped, and the child placed in such a posture, that the face, chest, and abdomen, shall be turned to that sacro-iliac symphysis toward which they are most inclined. Support must now be afforded to the external parts, as they are distended by the breech, which passes through the *outlet* with one tuber ischii in the pubic arch, and the other towards the hollow of the sacrum, while the shoulders are at the same time entering the *brim* also in a diagonal position. The head engages in the superior aperture as the nates make their exit from the *os externum*.

When the breech protrudes, it is to be embraced by the hands of the practitioner, who, by the pendulous movement already recommended, is gently to accelerate its transit towards the pubes, until the umbilicus is excluded. A portion of the funis is now to be drawn down, to prevent its being stretched or its circulation interrupted. As, from this moment, owing to the situation of the cord, the fœtus is exposed to considerable risk, its expeditious extraction becomes a desirable object. When the body is protruded as far as the axillæ, it is to be pushed, first to one side of the pelvis, and thereafter to the other, that the arms may be extracted in succession. In accomplishing this, we must avoid drawing them down with too sudden a sweep, lest the distended os externum be injured.

The extraction of the head, which is the most difficult and hazardous part of the delivery, is now to be effected. If the face be toward the left sacro-iliac symphysis, the practitioner

is to support the body of the infant on his right fore-arm, and *vice versa*, while he is to introduce his index finger into the mouth to depress the lower maxilla, and aid the head in making the necessary turn in the pelvis, that the face may be placed towards the sacrum. The opposite hand is to be expanded over the neck and shoulders of the child, which is now to be raised towards the pubes by the arm on which it rests, while the extracting force is to be exerted in the same direction. No attempt is to be made to extract the head until the face be towards the sacrum; and it is then best accomplished by the medical attendant standing in front of the patient, and drawing the fœtus steadily but cautiously towards him. In this manœuvre, the face is the first, and the vertex the last to pass. Though sudden and violent jerking, as it would lead to irreparable injury of the *medulla cervicis*, is to be avoided, yet it is to be remembered, that even in females who have formerly borne children, a strong effort is often required to effect this part of the process, and repeated powerful ones, in a primary labour.

Sect. II.—*Knee Presentation.*

These do not constitute so rounded a tumour as that of the head or breech; while a careful examination will detect the moveable *patellæ*, and the double prominence formed by the knee-joints. When the knees are found on the brim, the case may be reduced to a presentation of the feet, by bringing down each limb in succession; or otherwise, the legs are to be permitted to be protruded by the gradual advance of the fœtus; after which, the delivery is to be concluded as if the feet had originally presented.

Sect. III.—*Breech Presentation.*

This is distinguished by its fleshy feel, the tuberosities of the ischia, the sulcus which separates them, the occasional escape of the meconium, and the external genitals. Moreover, such presentations advance but slowly; and in the commencement of labour, they may very readily be confounded with head cases. There are two positions in which the breech may be found at either side of the brim, viz. the spine may be placed at the sacro-iliac junction, or at the acetabulum. In some rare instances, the limbs are so folded on the lower part of the body, that the feet accompany the breech.

If the pelvis possess sufficient capacity, which is to be decided by the mobility of the presenting part, there is no inter-

ference required until the breech begins to protrude, when a loop of the funis is to be drawn down, and support afforded to the perinæum. Whenever the nates are so far advanced that the practitioner can expand his hands on the ilia of the fœtus, it is to be placed in such a position that the face, chest, and abdomen shall be directed towards either sacro-iliac symphysis. From the moment the breech is excluded, it is advanced in the axis of the outlet, anteriorly betwixt the thighs, and the legs are to be permitted to drop out spontaneously; after which, the remainder of the delivery is to be terminated as directed in presentations of the feet.

A case of this nature may be retarded by deformity and confinement of the pelvis, or the size of the fœtus; and the nates and external genitals become ecchymosed from pressure, an effect which the attendant must avoid promoting by too frequent examination. When, by the tardy descent of the child, there is reason to apprehend deficiency of space; or when, by the supervention of hæmorrhage, or other unfavourable phenomena, it might be desirable to accelerate the delivery, if we are in attendance before the breech has become impacted in the brim, the presentation must be reduced to a footling case, by hooking down each limb in succession. Should the nates be too far advanced to admit of this practice, we have been advised to act on the presenting part by fixing the finger on the bend of the thigh, applying forceps over the ilia, or using a blunt hook upon the groin. The finger is inefficient, and the forceps is sure to slip, but by the hook, the extraction is certain. I have often, in such cases, introduced the blunt end of the common crotchet at the side of the pelvis, and turned it over the thigh, whereby a very secure hold was obtained, and the extraction speedily effected. As the instrument, when the limb is completely within its grasp, cannot slip, I would prefer this to any other method; but caution must be observed during the delivery, lest the integuments be lacerated.

The following is the order in which the fœtus is advanced in breech presentations. One tuber-ischii descends before the other, and that which is in advance, progressively during every pain, slides from behind forward, obliquely along the inclined plane of the maternal ischium, until it enter the arch of the pubes, while the opposite tuber, in the same ratio, gradually turns round and descends into the hollow of the sacrum. When the breech protrudes, the anterior fœtal tuberosity passes first through the arch of the pubes; and thereafter, the posterior one slips over the coccyx and perinæum. The shoulders engage obliquely in the brim when

the nates reach the external parts; and when they are protruded, the head enters the brim with the face toward either sacro-iliac symphysis. Upon each ear is placed its corresponding arm, which descends into the pelvis when the face enters the hollow of the sacrum. Finally, while the face is protruded, the vertex rises behind the symphysis pubis, and is the last part which is excluded.

It is necessary to make a guarded prognosis in reference to the fœtus, in cases of this order. There is little, if any, risk to the parent. The danger to the child arises from the head not being extracted with sufficient expedition from the pelvis, whence death must ensue from the circulation in the funis being interrupted, in which case the infant is felt to be affected with convulsive movements. In a primary labour, notwithstanding every precaution, the death of the fœtus is often unavoidable, from the resistance opposed to the extraction of the head, by the unyielding condition of the os externum. Such a misfortune should rarely happen, however, where females have formerly had children; and the success is greater than in the other varieties of this order.

The causes, besides the natural firmness of the os externum, which impede the extraction of the head, may be referred, *first*, to mismanagement; and, *secondly*, to certain conditions of the mother and child. By mismanagement I mean, the vertical extraction of the fœtus, whereby its chin is hitched over the pubes, or promontory of the sacrum, instead of its face, chest, and abdomen being turned to either parental sacro-iliac symphysis. The conditions of the parent unfavourable to the transit of the head, are, partial or general contraction of the pelvis; and of the fœtus, unusual bulk of its cranium, from over-growth or disease. The chin being hitched upon the sacro-sciatic ligaments of either side, has been specified as a cause of retention of the head, but it must be more imaginary than real.

When the chin is hooked over the pubes or sacrum, a finger or two are to be introduced into the mouth, and the face slowly turned toward that sacro-iliac junction to which it is most inclined, after which, the extraction of the head is to be effected as if no such mismanagement had occurred. If the position of the cranium cannot be rectified,—and a practised hand can scarcely fail to accomplish it,—the chin must then be depressed, and the face brought under the pubes.

If, in cases of partial or general narrowness of the pelvis, and those of unusual volume of the fœtal cranium, extraction cannot quickly be accomplished, after two or three careful

trials in the manner already recommended, the perforator must be introduced either behind or above the ear. This will be followed by the escape of a portion of brain, and consequent diminution of the volume of the skull, which may afterwards be extracted, either by the hand in the ordinary way, or by the assistance of the blunt hook. Great care must be observed in this part of the process, lest, by pulling too violently, the trunk may be separated from the cranium, which would be a more painful spectacle by far, than the mere puncture of the cranium. In retention of the head, forceps is recommended by continental practitioners; but, from the time which must elapse before it can be applied, it will be useless to the fœtus, while, if the extraction cannot be accomplished by the hand, and if forceps be used, it is evident that the head must exert such a degree of pressure upon the linings of the pelvis, as cannot fail to be productive of irreparable injury to the parent.

Order II.

A presentation of any region of the body, except the breech and inferior extremities, may constitute one of this order; and even head cases occasionally require to be referred to it. There is almost no part of the fœtus, but may sometimes be found presenting; the back of the neck even, the head being doubled on the chest, has been felt at the uterine orifice. The presentations which usually come under consideration in this order, are those of an arm, back, abdomen, or side; but the first is the most frequent.

The various cases may be easily distinguished, by a careful and deliberate examination. A hand may be known by its flatness, the length of the fingers, and the absence of those prominent points, as the ankles, which distinguish the feet. When the back comes towards the brim, the spinous process and the ribs will be felt, and enable us to determine the nature of the case. The abdomen will be known by its softness, and our feeling the funis.

All labours of this order are attended with considerable risk to the fœtus; nor are they altogether free from danger to the parent. It might have been remarked in cases of the first order, that if the pelvis be well formed, the fœtus of the ordinary size, and if the woman have had children formerly, the delivery may be completed without the assistance of a practitioner; but in the second order such results are rare under any circumstance, and when they do happen, fœtal life is generally extinct. And where such cases have been left

to nature, the parent has been destroyed by some formidable accident, such as hæmorrhage or rupture of the uterus. When we are not called until some time after the liquor amnii has escaped, an unfavourable opinion must be delivered as to the probability of our saving the child; and we must be guarded in our expressions as to the safety even of the mother, particularly if it be her first confinement. In a primary labour, the uterus generally is very unyielding; and it may be injured under the most careful management, while we are rectifying the position of the fœtus, and conducting its extraction. If the membranes be entire when we are called, and the liquor amnii present in the usual quantity, our prognosis may be favourable as to the parent; but it must still be guarded as to the infant, which may be lost during the extraction, more especially in a first labour.

In such cases, Hippocrates recommended the head to be brought to the uterine orifice, but Celsus proved that the delivery might be as easily accomplished by bringing down the feet; a method which, as is stated in the writings of Ætius of the fourth century,* was pursued about two hundred years previously by Philomenes; who, when the cranium became impacted, pushed it up and delivered by the pelvic limbs. But as it does not appear that the practice was generally adopted, it is evident that the ancients could not have been aware of its advantages, and that their only object was the mere extraction of the fœtus. The merit of reviving it was reserved for Ambrose Parè, who recommended it as a general rule; but it fell a second time into neglect, when Mauriceau enforced a renewal of it in the cases under consideration. Osiander and Flammant, towards the close of last century, recommended the cranium, in preference to the feet, to be brought to the uterine aperture, in some of the presentations of this order; and in the present day, the same doctrine is advocated, not by practical, but by speculative individuals, who say, that in all cases where the head is lower than the feet, as in shoulder presentations, an attempt should be made to bring it into the brim, if the pelvis be well formed, and the uterus not firmly contracted on the body of the fœtus. I can neither recommend nor disapprove of this practice from experience; but the difficulty during labour, of effecting even very trivial changes in the position of the cranium, induces me to think that it would not be so easily accomplished as extraction by the feet. The mutilation of the fœtus was another method pursued by the ancients; and I have been

* Ætius, lib. xvi. cap. xxiii.

informed on good authority that the practice of dismembering the infant still prevails, in some districts, among native practitioners in India. It is scarcely necessary to protest against so barbarous a proceeding, which, except in cases of great deformity, can rarely indeed be required. Also in an arm presentation, it was customary at one time to push the protruded extremity into the vagina, or beyond the brim of the pelvis; but independently of the risk of injury to the limb, this step is uncalled for, as the part will recede in changing the position of the fœtus.

Bringing down the feet first is the method which, for many years, has been generally adopted in the management of cases of this order, and is in every point of view the most approved practice. Although turning was imperfectly known, and occasionally resorted to, by the ancients, yet it must be viewed rather as a late improvement, since it has been revived and properly described by the moderns, after it had been repeatedly neglected by the ancients. There are other cases, besides presentations of the arm, shoulder, back, abdomen, and either side, where this practice has been pursued; *first*, where there is slight narrowness of the brim of the pelvis, with a view to economize the efforts which the parent might be compelled to exert, were the delivery altogether entrusted to her powers; *secondly*, where the descent of the head is impeded by a tumour; *thirdly*, in uterine hæmorrhage, before the cranium has entered the pelvic cavity; *fourthly*, in presentations of the funis; and, *fifthly*, in cases of plurality, where the patient has been exhausted by the efforts required for the expulsion of the first child.

Sect. I.—*Version with the membranes entire.*

Turning is comparatively easy when the membranes are entire, the liquor amnii in the usual proportion, the infant of the ordinary size, and the woman has formerly had children. In the *first* place, the bladder and rectum, if necessary, are to be evacuated; *secondly*, the position of the patient is to be the same as in natural labour; *thirdly*, if it be her first delivery, the hand is not to be introduced until the os uteri is almost fully dilated; or if she has had a family, when the dilatation amounts to about an inch and a half in diameter; *fourthly*, if the face of the fœtus incline to the right ilium, the left hand is to be used to bring down the feet, and *vice versa;* and, *fifthly*, in a first labour, venesection should take the precedence of every other step, with a view to occasion relaxation, and facilitate the delivery.

Prior to the operation being commenced, the nates of the patient are to be brought close to the front of the bed, and a pillow placed betwixt the knees, when the practitioner is to introduce into the vagina the hand warmed and anointed, employing the right or left according to the position of the fœtus. As the canal, from its contraction, must be more or less forcibly dilated and pain occasioned, one finger after the other, in gradual succession, must be cautiously insinuated. When the hand has passed the os externum, it is to be slowly advanced through the uterine aperture betwixt the pubes and the head, and gently moved along the spine or back, towards the sacral limbs. The extraction should be accomplished by grasping one of the knees as originally recommended by Dr Breen, and not one or both feet, as generally advised; after which it is to be drawn downward over the abdomen: by the opposite limb being retained, the dilatation of the vagina will be increased, and the head afterwards more easily disengaged. Delivery by the knee only requires a fair trial to be preferred to that by any other part, in a pelvis of natural formation.

When the membranes are entire, the liquor amnii copious, and the fœtus consequently very moveable, its position may certainly be changed before they have been ruptured; but if the surrounding fluid is sparing, the fingers will require to be forced through them whenever the hand is lodged within the uterine orifice. Should a contraction supervene while the hand is being introduced, or already in the uterine cavity, the practitioner must desist; he is not, however, to withdraw it, but leave it quiescent, and flatly applied on the part with which it is in contact. The position of the infant may be changed by grasping one knee, or a foot; but we have much more power when both feet can be embraced at once. The extraction of the head afterwards, however, can be more easily accomplished where one foot only, the knee, or the breech presents, than when both legs are originally advanced together. In bringing down the extremities, the most gentle efforts are to be used, so long as much resistance is experienced, until they are felt to come easily, which is a sure sign that the version has been effected, when they are to be brought into the vagina, with the toes directed towards the sacrum; after which, the delivery is to be accomplished, as if the case had originally been a presentation of the feet.

Sect. II.—*Version, after Rupture of the Membranes.*

When the turning is to be resorted to after the liquor am-

nii has escaped, the operation is attended with risk both to the child and to the parent, and with difficulty to the practitioner; since the uterus may be found so firmly contracted upon its contents, that a change of position cannot easily be effected. If the operator be in attendance when the membranes have given way, the hand should immediately be introduced, whereby the escape of the waters will in some measure be prevented, and turning still rendered comparatively easy. When the uterus, however, has had time to contract on the body of the child, before an attempt has been made to change its position, our first object before *turning*, is to induce relaxation of the contracted organ. If it be a primary labour, venesection must be our first remedy, and a large dose of the tincture of opium, our second.

In a weakly, delicate woman, or one who has been exhausted by long continued uterine action, blood-letting, unless there be a hot, painful state of the passages, and much excitement of the vascular system, is not called for. The quantity of blood to be extracted, therefore, except under urgent circumstances, should be such only as shall make a *moderate* impression on the pulse. In exhibiting the tincture of opium, which should immediately follow venesection, we must also be regulated by the condition of the sufferer. Forty or fifty drops are talked of by some teachers, as a sufficient dose; but I must be allowed to say, that, if in any case this quantity be found adequate, turning might safely be accomplished without it; for so small a proportion could have but little influence in allaying uterine action. In a woman of delicate habit, or in one exhausted by protracted labour, I have never given less than eighty, nor more than a hundred drops; but in females of vigorous stamina, I feel assured that neither of these quantities would be found sufficient. In such subjects, one hundred and fifty drops may be required; and in one instance in which Mr Andrew Beith, surgeon, Stirling, and the author were concerned, nearly half an ounce was administered before the hand could be introduced, though the woman had been the mother of several children, and was not by any means strong at the time. Twenty minutes after the narcotic has been exhibited, its effects are generally developed, when the practitioner must introduce his hand, carefully observing the directions formerly given. In half an hour, should the opiate not be found sufficient to allay uterine action, fifty drops more are to be taken; and after a similar interval of time, the operation again commenced. In some instances, where the uterus is acting with great vigour, it may be necessary to

repeat the dose several times; and this I conceive to be more judicious than ordering a large quantity at once, lest the organ might not contract kindly after the evacuation of its contents. In all cases, even after a considerable proportion of the tincture of opium has been taken, some degree of resistance to the introduction of the hand is still to be expected; but except during a contraction, it must be cautiously advanced, until the pelvic limbs can be reached. Finally, during that agitation inseparable from inexperience, the novice in practice, in the event of there being twins or more, in utero, must avoid bringing down a limb of each fœtus.

Sect. III.—*Shoulder presentations.*

When assistance is delayed the arm protrudes, the extremity is progressively advanced by the uterus acting on the body of the fœtus, until the shoulder is forced into the brim, constituting what has been styled, a presentation of the shoulder. These are very perplexing cases. If there be such a state of the pelvic structures as to require venesection, and if the patient has stamina, this remedy must be carried to the necessary extent in the *first* place; and in the *second*, a dose of the tincture of opium, in proportion to the vigour of uterine action, should be exhibited immediately thereafter. When relaxation of the womb has been induced, an attempt must be made to advance the hand, and, if possible, remove the fœtus by bringing down one foot. Where the shoulder is so far advanced through the brim, that the transit of the hand cannot be effected, the elevation of the impacted part may be tried by insinuating a blade of the forceps, or some similar contrivance, into the axilla. If the pelvic limbs can be reached, one of them should be noosed with a piece of narrow ribbon or tape, advanced by the practitioner on the point of his fingers, whereby the breech may, from time to time, in the absence of uterine action, be drawn down, while, by the contrivance placed in the axilla, we endeavour to raise the shoulder and other superior parts towards the fundus uteri, a method by which I have, in every instance except one, succeeded.

When a practitioner cannot carry the hand through the brim, either in consequence of its narrowness, or from the presenting part being firmly impacted therein, the mutilation of the fœtus is unavoidable. And if from ecchymosis, swelling, and vesication of the protruded extremity, with unpleasant fœtor from the vagina, there is just reason to apprehend fœtal life to be extinct, this practice, however

unpleasant it may seem, must speedily be adopted, if it were merely to relieve the maternal structures from pressure. When the extraction of the child in portions is resolved upon, the *first* step advised by some teachers, in such cases, is the separation of the head from the trunk; *secondly*, the removal of the latter; and, *lastly*, to get rid of the former. The objections to this practice seem to me stronger by far than those that can be advanced in favour of it. For, to say nothing of the difficulty and great risk to the parental structures from advancing a cutting instrument, however ingeniously contrived, beyond the brim of the pelvis, we are, moreover, subjecting the fœtus to a compound operation, which, by the results of practice, is proved to be rarely necessary; while, by decapitation, the command we originally had of the head is lost, whereby its extraction becomes much more difficult than when it and the body are united. When this unpleasant alternative is required, the excision of the protruded extremity should first be accomplished; the thorax and abdomen are then to be eviscerated; and finally, the crotchet is to be fixed on the spine or pelvis. When the extraction of the head is impeded, it must be perforated, and if necessary diminished in volume.

In some cases, from the pelvis being very capacious, or the fœtus diminutive, putrid, or premature, its extraction has been accomplished simply by pulling the protruded extremity, without resorting to either of the methods described in this section.

Sect. IV.—*Spontaneous Evolution.*

Occasionally, in cases of the second order of preternatural labours, the action of the uterus has been found to effect such a change in the position of the fœtus, as to cause the breech to descend and pass through the os externum, as if the case had originally been a presentation of the nates; which change the late Dr Denman, who was the first in this country to give an account of it, styled spontaneous evolution. This term might lead to the notion, that the alteration in the position of the child was ascribed to itself; but to prevent such a conclusion being drawn, Dr Denman distinctly states, that he was not himself satisfied with it, that he merely used it as a matter of convenience, and that the change was brought about by the uterus, and not by any impulse or exertion in the body moved. Of such cases, different views have been offered by practitioners and authors; and that advocated by the majority is, that the fœtus is born

double. To this opinion, however, I cannot subscribe, unless the infant be small, premature, or putrid; or unless the pelvis be unusually large. When the arm protrudes from the vagina, and a shoulder, with the corresponding side of the thorax, is advanced into the brim, since the presenting part is fixed, no spontaneous evolution can take place, unless the pelvis be sufficiently large to permit the child to pass with the head pressed upon the chest. When so extraordinary a change happens, it must be in presentations different from those above noticed. In the natural dimensions of the fœtus and pelvis, it is impossible this alteration can be effected, except where the presenting part is of such a nature, that it cannot be wedged in the pelvis, as the side, back, or the abdomen, unaccompanied by any arm. When the child is placed in any of these latter positions, it is impossible for the continued action of the uterus to effect such a change of presentation, since the part not being fixed, the breech may be forced through the pelvis. If, in our examinations, the nates be felt to descend, this process should be assisted by hooking a finger on the bend of the thigh.

Though it is possible for such cases to terminate by the unaided efforts of the parent, yet every practitioner who is sensible of his great responsibility, will feel indisposed to trust such labours to nature, since it is impossible to determine how long she may be in accomplishing the delivery, and since we know that both mother and child may become victims to our inactivity. Dr Denman himself, with his wonted fidelity, has afforded a lamentable proof of the fatal effects of procrastination, by stating, that of all the examples of spontaneous evolution of which he had collected the histories, in one instance only was the child born alive. Wherefore he was of opinion, that the only cases admitting of delay were those in which the fœtus was dead, to which he should have added a very capacious pelvis. But although a certainty of the infant being dead would relieve the practitioner from every anxiety for it, yet the situation of the parent, while the child was allowed to continue in utero, would be equally critical as before.

Enough, I trust, has been said to prove, that when a labour requires the version of the fœtus, and when this practice can be adopted with safety to the parent, it ought not to be delayed one moment after the passages are prepared.

CHAPTER V.

COMPLEX LABOURS.

The cases to be considered in this chapter are such, from the head presenting, as partly partake of Natural Labour, but which cannot be included in that class, in consequence of some anomaly in the presentation, or some general or local state of the subject, requiring peculiar management, or artificial interference. I propose, therefore, under this head, to treat, in the order in which they will be mentioned, of cases complicated with plural births, uterine hæmorrhage, convulsions, rupture of the uterus, protrusion of the funis, unusual capacity of the pelvis, hernia, retention of urine, and monstrosity.

Sect. I.—*Plural Births.*

The most usual number produced at one delivery in plural cases is two, but instances of three are occasionally met with; and examples of four, five, six, and even seven at a birth, have been recorded. Chambon relates a case of five, all of which he saw himself: they lived long enough to be carried to church for baptism.* M. Seignette of La Rochelle, relates the case of a woman who, in that town, had borne nine well-formed fœtus at one accouchement. Pliny and Paré speak of a still greater number having been produced at the same birth. The practitioner must avoid considering hydatids as ova, where a small collection of them is expelled.

We cannot set bounds to the operations of nature, or pre-

* I have just received from Dr Potts of Jersey, details of an interesting case in which, about twenty-one months since, five females were produced at a birth. The parents are natives of the island; the father, who has been in delicate health for a considerable time, was 38 years of age; the mother, who enjoyed good health when she conceived of the five, was 36; but since this event she also has become delicate. Their fare is very humble, and the woman pursues the laborious occupation of cutting sea-weed. The birth happened in the sixth month, in consequence of a kick on the abdomen, twelve days previously. One of the children lived about an hour, two a few minutes, and the remainder were still born. Two of them are smaller than the rest, but the whole are well developed. Since the foregoing birth the same woman has had twin females in the seventh month, and thereafter a child of the same sex at maturity. Previously to the birth of the five she had four males and two females; so that since her marriage, which happened fourteen years ago, she has produced fourteen children. She never understood that any of her own, or of the ancestors of her husband, had multiparous births.

tend, as some have done, to assign the limits of human fertility; but as I have been able to discover only one instance in the obstetrical records of this country, of more than five children at one birth, and which, in this case, were six abortions, I am disposed to consider all accounts of a greater number at one accouchement fabulous. For human fœcundity in this empire, as may be proved by the records of lying-in establishments, is greater than that in any other part of the known world; and therefore it is not unreasonable to allege, that cases of extraordinary numerical productiveness should, on this showing, be most frequent in these kingdoms.

It may be asked, *first*, are these multiplicate births the result of one, or of repeated seminal applications; *secondly*, do they depend on the vigour of either party in particular; and *thirdly*, are the products furnished by one ovarium, or is an ovulum fœcundated in each of these organs? There are various facts which would seem to support the conclusion, that plural productions are the result of one sexual intercourse. Females in their first pregnancy, are not more frequently multiparous than in their succeeding gestations,—though in women recently married, it may be presumed, that, for some time after the union, the sexual intercourse is frequent. In the next place, plural births have been procreated by males in so debilitated a state from disease, as to render them incapable of sexual intercourse, except at distant intervals. As to the second question, John Hunter, by analogical experiments, proved the great influence of the female in the function of re-production. The subjects were two young pigs; the one was deprived of an ovary, the other was not. The uninjured animal exhibited tokens of an amorous disposition some time previous to her partially spayed companion. In due time, they were both allowed to have interviews with the male, but the one that was not castrated, produced in all, 162 young, while the spayed one had but 76. From many facts recorded in the literature of our profession, there cannot be a doubt that the power of procreating plural births is sometimes hereditary, and may be possessed by either sex.* In regard to the third question, the rudiments of twins may certainly be furnished by one of the ovaries,† or an ovulum may be developed in each of these organs; and in cases of triplets one of the corpora lutea has been found in one of the ovaries, and other two in the opposite organ.‡

* Page 120.

† In Burdach's Physiology, a case is related where a woman twice produced twins, although one of her ovaries was incapable of performing any function, vol. 2, p. 224.

‡ Blundell's Lectures, Lancet, vol. xiii.

Old age, and a spare habit of body, are conditions on the part of the female, unfavourable to a multiparous progeny. As a further explanation of the formation of plural productions, it may also be assumed, that there is occasionally in the ovaries, more than one ovulum in a condition ready to be acted on by semen. From the rare occurrence, however, of plural births, considering that in many instances sexual intercourse must be repeated at short intervals, it would seem, that after a successful congress, there is an inaptitude to conceive.

In plural cases, the labour may be natural, preternatural, easy, or laborious. Sometimes all the infants present the cranium; at other times, they all pass by the feet; or when there are but two, the one may come by the head, and the other by the breech or heels. From January 1841 to July 1843, the head of both fœtus presented in six out of twelve cases. In two instances the children were of different sexes, and each, as observed by Dr Ramsbotham, presented the head and breech. Where females have formerly had children, the delivery is generally easy; but in a primary labour, it is protracted, and apt to be followed by hæmorrhage.

The size of individual children in plural births is generally less than that of unigenite infants; and when they exceed two in number, one or more of them is often still-born; or when all of them are born alive, it seldom happens that the whole continue to be reared for any length of time; for frequently gestation is not completed, and premature labour is induced, from the volume of the womb being productive of disordered function, and disturbance of some of the great vital organs, particularly the lungs and the heart. Another cause which may be supposed to favour the premature evacuation of the uterus, is the inability of the system to support the increased demands made upon it in plural cases. Females of spare habit, as already stated, rarely go on to the full time. Twins, however, are generally born alive, and continue to be reared; and the first born, is, in most instances, the largest.

A variety of diagnostic signs have been specified, by which it has been supposed, the presence before labour, of more than one fœtus in utero, might be determined; but every one of the marks enumerated is equivocal. I was once concerned in a triplet birth, but although the woman, who was low of stature, went to the full time, her size before delivery was not remarkable. No means can be relied on for detecting the presence of twins, except auscultation, by which, speaking from experience, I can say that this information

even during labour, determine the presence of more than one fœtus in utero, unless, as is related in Sacred History, parts belonging to each present. But although the presence of plural births is involved in so much obscurity during pregnancy, and at the time even of parturition, we can easily ascertain, after the expulsion of one fœtus, whether any more remain in the womb, by merely passing the hand over the abdomen. If there be a second, or more than the one already expelled, this cavity will be found firm and tense. But the practitioner must avoid confounding the tension occasioned by the presence of coagula from internal hæmorrhage, with that arising from the detention of a second fœtus, which is hard, while that produced by the former cause is soft. The novice is apt to mistake a large placenta for an additional child. When the uterus contains only the placental mass, the abdominal parietes are so relaxed that they may be folded round the hand. If an examination be made, *per vaginam*, after the contents of the womb have been expelled, the passage will be felt more and more contracted as the fingers are advanced; but if the organ still contains an ovum, the vagina becomes more capacious as we approach its upper extremity; and the membranes of the retained fœtus are at last felt.

Cases of this nature are more hazardous to the parent, and attended with a greater degree of responsibility to the practitioner, than those of single births; but except in primary confinements, the management is easy.

Whether the head, feet, breech, or the arm present, the extraction of the child is to be conducted according to the rules laid down for the management of these various presentations. It is to be particularly remembered, that if the parts of two fœtus are felt, we are to favour the advance of the one which presents the head first, by endeavouring to push the presenting part of the other above the brim. Were the cranium of one to enter the brim with the feet of a second, and the limbs to be drawn down, the chin of one might be hitched over that of the other, and the heads of both so impacted in the pelvis, that they could not be disengaged without the mutilation of one or both of them.* When the sacral extremities of one enter the brim with the head of a second, the latter may require to be embraced by forceps.

When the first fœtus is expelled, two ligatures are to be

* Edin. Med. Jour. 1822 ; also Med. Chir. Transac. Lond. vol. xii. part 1. In both cases, the children were all extracted by the crotchet, from the error in question.

applied to the funis, exactly as in single births, lest injury might arise to the unborn child, should their placentæ be connected by vessels. In the next place, if the first born be a male, a piece of ribbon should be placed on the neck or wrist, to identify it, lest the infant in utero should be of the same sex. When we are certain of a second child, warning should be given to the attendants regarding the nature of the case; but this information is to be concealed from the mother, until the second infant is on the eve of being expelled, lest, from an apprehension of her sufferings being increased, labour might be suspended. If this one be in a favourable position, and the womb in a state of activity, the membranes should be ruptured, and the birth will speedily be accomplished, from the passage having been dilated by the transit of the first fœtus. After its expulsion has been effected, the action of the uterus is sometimes suspended, and it comes to be a question how long the process should be suffered to remain in this state? If the labour be premature, there should be no interference to cause the action of the womb to be renewed, as by allowing the second child to remain in utero, its vigour will be increased, and there will be a better prospect of its being reared; but during this delay, the patient should be carefully watched. The detention in the womb, of a fœtus which has attained maturity, must be attended with considerable risk to the parent, lest detachment of the placenta of the infant that has been emancipated, might ensue and give rise to troublesome effusion. On this account, a woman so circumstanced, should not be lost sight of by a practitioner, until the complete evacuation of the uterus has been effected.

Should contractions be totally suspended after the birth of the first infant, half an hour should be allowed for repose, during which, a little mild nourishment and cordials must be ordered for the patient, and free ventilation of the apartment; while the necessary steps are also to be adopted for recruiting her mental powers. When the period in question has expired, an attempt to restore the power of the uterus is to be made, by the indirect stimulus of friction, and pressure upon the abdomen by means of the binder; and with these auxiliaries, when the fœtus is in a favourable position, ergot should be combined. Should any unpleasant symptom supervene in the mean time, turning must be resorted to. If there be more than two, the same management is to be pursued in their extraction.

The placentæ are next to be disposed of; and it is to be may certainly be attained; nor can we in any other manner,

remembered, that their separation is not to be attempted until after the fœtus, whatever number there may be in utero, have been removed, though occasionally each infant is followed by its secundines, which, however, is by no means desirable. After this has been accomplished, a little cordial is to be administered to the parent, and the binder drawn tighter round the abdomen, with a view to excite uterine action. When contractions supervene, all the umbilical cords are to be seized, and the masses removed slowly, cautiously, but simultaneously; after which, one or two towels, in form of compress, are to be applied over the womb, and the binder again drawn firmer. Where the organ is so torpid as to be incapable of detaching the placentæ, the practice already recommended in the third stage of Natural Labour, is to be adopted. Finally, as hæmorrhage, from the relaxed condition of the uterus, is apt to supervene in such cases, the practitioner should not quit the patient for a reasonable period.

Sect. II.—*Uterine Hæmorrhage.*

In discussing these cases, I shall merely consider the subject at present as it occurs during pregnancy, parturition, and after delivery, since those effusions which happen unconnected with these states, will more properly fall to be noticed in another part of the work.

Of all the cases in which we are called upon to exercise our art, there are none more appalling in appearance, or formidable in result, than those which are now to be investigated. Of this we are occasionally afforded very painful proofs, by patients dying in a few minutes, though surrounded by practitioners of great experience. Hæmorrhage may take place at any stage of pregnancy, during parturition, and even in the puerperal state. The most usual periods for this accident to happen are, towards the close of the third, and from the commencement of the seventh month, onwards, to the conclusion of gestation. In the third month the uterus, from the preponderance it has now acquired, sinks lower in the pelvis, whereby it is liable to be acted on by causes which have less influence, either prior to or after this time. Of these, the sexual congress; undue exercise with the sacral extremities, acting through the medium of certain muscles situated in the pelvic cavity; and the action of powerful aperients, giving rise to severe straining while the individual is at the commode, are all very obvious. Why flooding should frequently be encountered during the two

latter months of pregnancy, will be explained when the exciting causes come under our review.

Among the conditions which may predispose to this accident, some are general, others local. Of the former, general plethora; and of the latter, a menorrhagic disposition, the delicate union betwixt the placenta and the gravid uterus, the adhesion of the mass to the anterior parietes of the organ, and unusual expansion of the former, may all be particularized. When general plenitude exists, by whatever cause the current of blood is impelled into the uterine vessels, some of those terminating in that part of the womb to which the placenta adheres, are forced, and the mass is partially detached, whereby the lacerated vessels are left exposed, and hæmorrhage produced in proportion to the extent of the injury. In a female who is subject to menorrhagia, the uterine vessels, owing to their natural delicacy, must, from any excitement, whether local or general, be easily forced, if not ruptured, and hence effusion. This condition of the uterine vascular system is admirably compensated, partly by the intimate connection which subsists betwixt the organ itself and the membranes of the ovum, and partly also by the uniform pressure which is exerted on both surfaces of the womb; externally, by the ambient viscera and abdominal parietes; and internally, by the various parts which compose the ovum. As formerly stated, the uterus, however, is never fully distended, but on the contrary, more or less relaxed, which state, as well as its natural plastic structure, will, in the event of a laceration, or unusual dilatation of any of its vessels, permit such a quantity of blood to be effused betwixt its parietes and the membranes of the ovum, as might bring life into jeopardy, or extinguish it altogether. Here again nature interposes to prevent results so formidable; for this internal effusion is followed by uterine distension, and, ultimately, by syncope. When the womb becomes tense, it is excited to re-act upon its contents, and by grasping the ovum, a check is given to effusion upon the principle of compression; or if syncope be induced, the vascular system becomes paralyzed, coagula form in, and at the unprotected extremities of, the bleeding vessels, and acting upon the principle of a compress, arrest for a time the further loss of blood. Though it is important to be aware that nature thus makes an effort, in two ways, to support the system under its losses, and that by judiciously economizing her resources, much may be done to aid her prostate energies, yet it is but too clear that the assistance she bestows is far too uncertain to be relied on. When the secundines are

adherent to the anterior parietes of the uterus, their greater liability to detachment from blows upon the abdomen is obvious. A placenta which presents a wide surface is apt, by its extension towards the cervix uteri, to be prematurely detached during the first stage, and be followed by effusion.

In regard to the exciting causes, these, by the late Mr Rigby, in his excellent essay, were divided into accidental and unavoidable. The former may act at any period of gestation; the latter, during the two last months only. Whatever produces a separation of the placenta from the uterus, must, by lacerating the utero-placental vessels, cause an effusion of blood. Such an accident may arise from external injury, as blows and bruises; violent exertion of any kind, as lifting heavy bodies, and straining at the commode; and mental emotion, or whatever may occasion either local or general excitement. External violence, as falls and blows, do not exert their influence directly on the uterine system, so often as might at first be supposed; more frequently, they affect it indirectly, by inducing disturbance in the heart and arteries. The texture of the uterus and its undistended condition, are admirably calculated to lessen the injurious effects upon it, of pressure, *ab externo*. It requires a very severe external injury to occasion lesion of any of the tissues which constitute the ovum, and one more violent still, to affect those of the uterus itself. In 1822, the author was called to a patient, who, while in the last month of pregnancy, received a kick on the centre of the abdomen, between three and four in the afternoon. This was followed by what the attendants called a fit, and uterine effusion; and a little past ten at night, the woman was delivered of a still-born fœtus, a third of whose placenta seemed to have been detached previous to the commencement of labour. The ensuing morning, symptoms of abdominal inflammation supervened, and early on the fourth day thereafter, the woman died. There was not the slightest lesion of the uterus; the only appearances were inflammation of the peritoneum, and an extensive extravasation of blood among the abdominal muscles, extending to the spine.* In the 12th vol. part 1st, London Medico-Chirurgical Transactions, are detailed the particulars of a case in which the wheels of a heavy laden stage-coach passed over a woman in the ninth month of pregnancy, and although the liver was rent in two, yet the uterus escaped uninjured, and the fœtus was emancipated alive by the Cæsarean section.

* Author's Work on Puerperal Fever, p. 208.

Some of the causes enumerated, independently of their acting in a general way through the medium of the circulating system, may also give rise to hæmorrhage, by exerting their influence more locally. This I apprehend to be the *modus operandi* of severe straining, or whatever may cause sudden and violent action of the abdominal muscles; a consentaneous action of the contractile tissue of the uterus takes place, followed by detachment of the placenta. The same explanation will often account for uterine effusions in the early months, in consequence of the mental passions.

The exciting cause, peculiar to the two latter months, is the implantation of the placenta on the cervix or os uteri, or on both, and is the most formidable of the whole. Such a state is oftenest observed in females of relaxed habit, and in such as have had a large family. Though uterine effusions may certainly arise from a detachment of the mass, when placed in a different part of the womb, yet it is by no means so frequent, nor so formidable a cause as the present. In the eighth and ninth months, the os and cervix uteri are undergoing a process of effacement; or, in other words, as pregnancy advances, these latter expand to form part of the general cavity; but as the mass is incapable of expansion, it is detached in the same ratio, leaving the lacerated extremities of the utero-placental vessels unprotected, and hence effusion. There may be an oozing of blood for several weeks before uterine action is established; but, until this event, the discharge, generally speaking, is not very profuse. A flow of blood, per vaginam, is sometimes the result of organic lesion of the uterus, but such cases are attended with excessive pain.

The effusion may be profuse, though, on examination, the os uteri be found very little dilated; and it is not to be forcibly opened with the finger to determine whether the placenta present, unless, from the urgency of the symptoms, the practitioner shall consider it imperative on him to proceed to its evacuation. When the effusion is but trivial, and gestation not completed, it must be an important object to prevent labour, that the fœtus may increase in vigour; wherefore, irritation of the os uteri is to be carefully avoided. But when the separation of the placenta is extensive, neither the effusion nor the action of the uterus can be suspended, until the contents of the organ shall have been expelled. *In a placental presentation*, independent of the unusual discharge, the nature of the case is farther recognised by the head, or other presenting part not descending; the margin of the os uteri being felt much thicker than usual; the patient having, du-

ring the last few weeks of pregnancy, occasional copious gushes of blood without any cause, when, indeed, she is in a state of quietude, or during sleep; the fibrous texture of the placenta, which we must avoid confounding with coagulum. As this latter distinction is of the first importance, an examination, carefully conducted, must be instituted: the placenta is recognised by its greater firmness, stringy or fibrous texture, its attachment to the uterus, and the resistance which it offers to the finger. A coagulum, on the contrary, admits of being easily encircled, perforated, and moved from its situation by the finger, while it is void of fibrous structure. But we are not to forget that the mass, in many instances, does not extend so far upon the cervix that it can be reached by the finger, and that a coagulum is the only object that can be felt; but if there be successive gushes of blood, or profuse continuous hæmorrhage, it matters not, except in delivering our prognosis, whether the placenta can be felt or not, since the management must be the same. In some cases there is an oozing of blood for many days, or some weeks, before the term of pregnancy is concluded; and when the cervix begins to dilate, this draining becomes a succession of gushes. Hæmorrhage, in other instances, commences only with labour. These varieties are dependent on the position of the placenta; for the nearer it approaches to, or the more it encircles, the os uteri, the earlier the appearance of flooding, and the more profuse the quantity.

Hæmorrhage may appear after the expulsion of the fœtus, and even at the lapse of days after the ejection of the placenta. When it happens under either of these circumstances, it may be ascribed to one of the three following causes; *first*, torpor of the uterus from previous long-continued, or over action; *secondly*, the imperfect removal of the placentary mass; and *thirdly*, over-exertion soon after delivery. How often is the influence of this last cause experienced by those females who betake themselves to the erect position too early after parturition! The uterine vessels are forced by compression, from the abdominal muscles being thrown into action.

The late distinguished M. Baudelocque of Paris, speaks of hæmorrhage from rupture of the umbilical vein, but this can only affect the fœtus.

When a sanguineous effusion appears per vaginam, it is a phenomenon so formidable as to command the anxious attention of the medical and other attendants, and is particularly dreaded in a pregnant or puerperal woman. Hæmorrhage, however, may be going on internally, and that too without

any external effusion to give notice of the condition of the patient; than which there is no practical point of more vital importance to be determined, since the mother of a young and numerous family may sink while surrounded by her friends, at a moment when she is thought to be in a state of security.

The phenomena which, with the diminution of the circulating mass, that arise during the continuance of flooding, are highly important. The pulse, for a moment or two slow at first, soon changes to a state of frequency, which continues to increase until it cannot be numbered, or becomes extinct; its extreme fluttering is another peculiarity; at one time it is quick, at another slow, and the next quick again. These conditions of the circulation are the invariable attendants of uterine hæmorrhage. The face and lips become pale, the eyes glassy, the vision and the intellect impaired, accompanied by tinnitus aurium, urgent thirst, hurried respiration, with alternate sobbing and sighing, and general coldness. The circulating mass ceases to impart its wonted stimulus to the nervous system; all the functions, consequently, are performed with less energy. The general system is rendered more irritable than formerly, and trivial expressions exert greater influence, giving rise to many other hysterical affections, which are alternated by excessive languor. The stomach and alimentary canal participate in the general derangement; there is either loathing of food, or actual vomiting of every thing that was swallowed, and finally syncope supervenes. Sooner or later reaction takes place; the pulse which was almost imperceptible and intermittent, becomes more distinct and regular, breathing more natural, the countenance more animated, and general warmth is somewhat restored. This amendment however, may be but transient, for the hæmorrhage may return and be followed by all the foregoing distressing train of symptoms, with extreme restlessness and jacitation until the system is again laid prostrate by fainting. When the separation of the placenta has been very extensive and the loss of blood profuse, the patient may sink during the first attack; or if the system has rallied repeatedly, it is not unusual for the scene to be terminated by convulsions.

In regard to our prognosis, as little time as possible is to be expended by the practitioner in speculating upon the symptoms, lest the patient slip through his hands. Until after the close of the fourth month, fatal event can scarcely be accounted for without mismanagement, except in feeble or debilitated subjects; for, previous to this period, the uterine

vessels are not sufficiently large to pour out their contents in such quantity as to prove suddenly fatal; but under the circumstances stated, the author has known one woman die in the early part of the second, and two others in the middle of the third month. Besides the period of gestation, we must also be regulated in our prognosis by the circumstances which may have led to the detachment of the placenta. When the mass has been separated by any violent cause, such a case is always to be considered particularly hazardous. The most critical period, perhaps, at which the accident can occur, is from the early part of the fifth to the commencement of the seventh month, since, betwixt these dates, the os and cervix cannot be of sufficient capacity to receive the hand of the practitioner to remove the fœtus or placenta, should such practice be deemed expedient. Hæmorrhage, from implantation of the mass over the os and cervix, is the most dangerous variety to which we can be called—far more so than from its detachment when adherent to any other part of the uterus. For, as the aperture and cervix must progressively expand during labour, to permit the fœtal head to pass, the placenta will be separated in the same ratio, wherefore, the effusion is not only profuse but discharged with rapidity; which, as well as a shattered condition of the system, by whatever cause produced, will require the most guarded prognosis. When the mass is in a higher position *in utero*, the effusion is moderated as the fœtus advances, since the organ must contract in the same proportion, whereby the bleeding vessels are compressed. In a state of great prostration, more especially in consequence of protracted labour, even a moderate loss of blood may sink the patient irrecoverably. The author has never witnessed uterine effusion to any extent in a phthisical patient. Under judicious management, a favourable prognosis may be delivered regarding flooding during the first four months; but the ovum is generally thrown off.

The most incredible anecdotes have been related as to the quantity of blood which females have been known to lose in cases of this nature. One woman is reported to have lost a large chamber-pot full daily, for fourteen days; but I hope the reader's good sense will induce him to receive, with due caution, such marvellous histories. The author was once concerned in a case, in which about sixty ounces were effused in twenty minutes in a remarkably vigorous young lady, and though she was so much reduced in consequence, that for many hours afterwards, her voice was inaudible at a little distance from the bed-side, yet the following day she seemed as well as the generality of women after a first labour. In

healthy patients, one or two pounds may escape betwixt the birth of the infant and the removal of the secundines, without any unpleasant effect; but, it is proper to remember, that, in an exhausted state of the subject, a smaller quantity has had fatal consequences. In forming an estimate of the danger therefore, we must, independently of other circumstances, be regulated in our opinion by the effects produced, since sometimes a very copious flow is supported with impunity, while in other cases life is extinguished by a very moderate loss.

In speaking of the treatment, I shall *first* notice that which must be pursued in the early months; then the management where pregnancy is farther advanced; and *lastly*, what must be done in hæmorrhage after delivery. The practice in the early months will depend on the extent of the effusion, and that of uterine dilatation. If the discharge be a mere oozing, and the pulse unaffected, while the dilatation of the os uteri is imperceptible, the flooding may, perhaps, be restrained, and expulsion of the ovum prevented, by the practice to be mentioned; which, whatever the result may be, ought to be adopted. But when the pulse is weak and frequent, the uterine effusion copious, and the os uteri sufficiently open to receive the finger, hæmorrhage cannot be restrained, except by the evacuation and subsequent contraction of the uterus. In this state the patient must be diligently watched, for neglect has frequently led to the loss of the ovum, and occasionally also, as already stated, to that even of the parent.

When the condition of the pulse, the extent of the uterine effusion, and the state of the os tincæ, are favourable for attempting to restrain the progress of expulsion, absolute quiet, with a recumbent posture on a hair mattress, are to be enjoined for the patient. The quantity of bed-clothes should be such only as shall prevent her feeling cold; and the lying-in apartment must be freely ventilated. Forty or fifty drops of the tincture of opium, or twenty of the sedative solution, should be given to allay irritation. These measures carefully persevered in for a sufficient length of time will frequently arrest trivial hæmorrhage; and, unless rigidly pursued, no woman can be secure from its recurrence. Cold applications, immediately to be noticed, are scarcely required in slight cases. Although the discharge may have been greatly moderated, or may have ceased, the risk of its re-appearance from the slightest indiscretion, cannot be too forcibly impressed upon the patient. When flooding is not profuse, and seems to arise from general plethora, it may be much moderated before the arrival of the practitioner, from the partial

exoneration of the uterine vessels, the influence of fear, syncope, or the individual having betaken herself to the recumbent posture on the first evidence of alarm. Besides the plan already recommended, venesection to such an extent as to make a moderate impression on the pulse will be found highly useful; but in no other description of cases can this remedy be contemplated.

In profuse hæmorrhage, whether unaccompanied by general plentitude or not, the greatest advantage will be derived from refrigerant applications, which may be employed so as to have a direct or indirect influence; and which, in a primary attack, and in a woman possessing stamina, may be used fearlessly. The lower part of the abdomen, external genitals, and thighs, are to be covered by a succession of thin compresses immersed in cold water and acetous acid, or a solution of the muriate of soda, or of ammonia. Or cold may be employed in a way to exert a more direct influence, by a quantity of a saturated solution of alum being cautiously thrown into the vagina repeatedly during the continuance of the effusion. In a woman whose system is reduced, whether by previous indisposition or repeated flooding, the application of cold requires very nice management; great care must be observed to prevent it exerting too permanent an action on the system; and, therefore, whenever it begins to affect the pulse, it must be either much modified or discontinued. Moderate compression of the abdomen during the retention of the fœtus, or the same remedy more freely exerted when uterine action cannot be restrained, will always prove highly beneficial when the effusion is profuse. The action of cold, either as a local or general agent, where the intention is to moderate excitement, is too well understood to require explanation here.

The regulation of diet constitutes an essential part of the treatment; it must be light, dry, and abstemious. Liquids, except in such proportions as shall effect the passage of the more solid part of the food, are to be interdicted; and those of the mildest quality only allowed. Were a different conduct pursued, vascular excitement, and a recurrence, or an increase of the hæmorrhage, would be certain from a renewal of congestion. These points are to be explained to the attendants, to prevent over indulgence in stimulating food, and fluids to allay the urgent thirst inseparable from such cases.

In the latter months, the measures to be adopted must, if possible, be more prompt and decisive than those recommended for the earlier stages of pregnancy; for now the uterine vessels, in consequence of the size they have acquired, are

capable of discharging a large quantity of blood in a short time, which, in advanced gestation, renders the accident most alarming. It is always more to be dreaded among the poor than those in the higher spheres of life; since the former, because they are ignorant, are also too frequently fearless, and that they disregard our advice. If the effusion be moderate, and the strength good, we may palliate and endeavour to carry the patient somewhat further on in her pregnancy, that an opportunity may be afforded for the fœtus to increase in vigour; and a period of ten or fourteen days will be found to exert a material influence on its system. To answer the object in view, the same conduct must be adopted as directed in cases of the early months, when it is intended to prevent the expulsion of the ovum, and a powerful opiate must be ordered, to suspend, if possible, the action of the uterus. To whatever part of it the placenta be adherent, the expulsion of the ovum is certain, and that speedily, if the detachment of the mass amount to about a third part of its whole extent. When a separation of a portion of the secundines takes place, in consequence of their being connected with the os and cervix uteri, we can rarely prevent premature labour, however small the detachment.

Stuffing the vagina with soft rags, previously immersed in some refrigerant application, has been highly spoken of by some eminent practitioners in cases of the latter months; but I am far from considering the practice judicious; nor do I think it safe even, unless a man of experience were to sit constantly at the bed-side of the patient to watch the changes of the pulse. When the canal is stuffed, or the plug, as it is called, is used, effusion is going on within; and, if a woman be surrounded by inexperienced persons, as there is no external appearance of blood, she is considered in a state of security until she gives a sudden gasp and unexpectedly expires; for non-medical attendants cannot be expected to know much of the state of the pulse. The author has been called to several cases, where, in consequence of the secundines not having been extracted in due time, external effusion was prevented, and it was not known that hæmorrhage existed until too late to save the patients, whose passages, on the removal of the placenta, were found charged with coagula. As, therefore, the analogy betwixt *retention* of the after-birth and the *plug* is considerable, and as the latter will not arrest internal effusion, it must, on the whole, be considered highly improper. In the early months it may be used with advantage, since the uterine cavity is not only small, but cannot dilate to any extent. The only examples

of advanced pregnancy in which I would sanction the plug, are those with rigidity of the os uteri, and where we are consequently awaiting a change in the condition of the aperture, preparatory to the evacuation of the uterine contents; but even in these cases, the practitioner ought to be almost in constant attendance during the employment of the foregoing remedy.

In cases where the system is in a state of great prostration, from the recurrence of hæmorrhage, the use of solid opium, in large doses, has been highly lauded by one or two practitioners, to support the *vis vitæ*, and to suppress the secretions. So highly valued was this remedy at one period, and still is by a few members of the profession, that one or two individuals were so anxious to be considered as entitled to the merit of having been the first to recommend it, that they considered no censure too severe for any one who called in question the utility, or neglected to do homage to the discovery. The merit, however, if there be any, and which is more than doubtful, is due, not to any one alive, but to a man who lectured on midwifery, before any of the existing race of lecturers or professors of the art were even begotten, viz., the late Dr Young, professor of midwifery in the university of Edinburgh, who, in such cases, was accustomed to order it in large doses, as may be seen by any one who can have access to a copy of his MS. lectures. In the *first* place, as to any support which opium, in doses of three or four grains, occasionally repeated, can afford to the vital powers, it must be trifling indeed, or next to none, since this drug, in such doses, must act not as stimulus, but almost as a direct sedative. And *secondly*, it would be the height of absurdity to draw any analogy betwixt uterine hæmorrhage, and any of the healthy secretions of the system, since they no more resemble each other, than a free discharge of urine resembles the natural catamenia. If ever opium, in large doses, has restrained or moderated flooding,—and it may have done so,—it must have acted as a sedative, and proved beneficial by moderating the activity of the vascular system.

When uterine effusions in the latter months cannot be restrained by the means which have now been enumerated, the practitioner must proceed forthwith to evacuate the uterus; for whatever be the means employed by nature for arresting hæmorrhage under other circumstances, and which it is not our province to enquire, it must be admitted, when the uterus is enlarged in consequence of gestation, that the flow cannot be suspended, except by the evacuation and proper contraction of the organ, whereby its large and nume-

rous vessels are greatly contracted in their area. There is a general belief that the effusion is likewise moderated by the formation of coagula within the lacerated extremities of the bleeding vessels; but however beneficial this may prove in trivial injuries, it could have little influence in more aggravated cases. It will be necessary, however, *first*, to enquire whether the uterus can always be easily evacuated. Sometimes the os uteri is so little dilated, and so unyielding, that were we to persist in passing the hand, a laceration of the aperture would be the inevitable consequence. Hæmorrhage may be going on very profusely, though the aperture is not dilated to a sufficient extent to receive even the summit of the index finger; and what is to be done? Here again some people, reasoning from analogy, have recommended the vagina to be stuffed upon the same principle that we plug the nares in epistaxis; but there is a material difference betwixt the structure of these canals. The uterus and vagina are composed of elastic, the nares of inelastic materials, which would resist effusion, whereas the former would yield to it. The ingenious Puzos perceived this difference, and to obviate it, he recommended, where the hand could not be passed, and where the symptoms were urgent, to rupture the membranes, that the uterus, in a ratio with the liquor amnii that should escape, might contract, and come into immediate contact with the body of the fœtus, and thus by the two-fold effect of compressing and blocking up the unprotected vessels, the hæmorrhage might be stayed. That the practice recommended by Puzos is very ingenious, and will, to a certain extent, act as he anticipated, is obvious, but it is not infallible; for, into the vacuities formed by the decussation of the fœtal limbs, a quantity of blood may be effused, sufficient to reduce the vigour of the system, favour relaxation, and consequent redilatation of the uterus,—conditions which would immediately be followed by a recurrence of the flooding.

When none of the foregoing plans can be pursued or relied on, the patient must be ordered from 80 to 120 drops of the tincture of opium, which, with the loss of blood, will in due time render the uterine aperture dilatable; and as it is of the last importance to decide when it is so, the patient requires to be closely watched, for the moment this state is established is the instant for proceeding to evacuate the uterus. During the delay let the vagina be *uniformly stuffed from one extremity to the other*, with detached pieces of rag, by which it can be much more effectually accomplished than with a handkerchief, as is generally advised. The introduction of the fingers in succession must be commenced when the os uteri

is dilated to about the size of a crown piece; but until this can be effected, the practitioner, as already recommended, should be in constant attendance. But however desirable it may be to accomplish the evacuation of the uterus, that we may favour its contraction, the version of the fœtus is to be undertaken as a last resource only, when there is syncope; and the extraction conducted very progressively when there is a state of prostration. In either case the patient must, if possible, be roused from her torpor, and some vigour be infused into the system, before turning be commenced.

When neither the recumbent posture, cold applications, nor the rupture of the membranes, have moderated the effusion, and when we have determined on the introduction of the hand to remove the fœtus, how are we to avoid a farther separation of the placenta, admitting that it is attached to the os and cervix uteri? If it be limited in its connection to the right side of the cervix, for example, the hand must be slipped up to the left; but if it encircle the whole aperture, it is usually recommended to force the fingers through its centre, as by this proceeding it is supposed, that we can endanger the infant only; whereas, by separating the placenta towards one side, it is asserted, that we also bring the life of the parent into jeopardy. The result of the author's experience induces him to recommend the latter plan, and he has never yet had the misfortune to witness the death of a patient from flooding, arising from a placental presentation; while he has reason to know, that the result has been very different with some practitioners within the circle of his acquaintance, who have pursued the former method. When the hand is forced through the centre of the mass, a general detachment of it must take place, which alone can account for the fatality; whereas when a partial separation only is produced, as happens by disuniting it towards one side, the pressure of the practitioner's arm upon the point where this may have been effected, until the presenting part of the fœtus is brought down, and ultimately of the body itself, upon the whole circumference of the cervix and os uteri, must greatly check the hæmorrhage, since the vessels which will be exposed by disconnecting the mass, must thus be compressed. The author was once called to a case of premature labour in the eighth month, under the care of a midwife, in which the placenta was expelled before the fœtus, whose head, from maladroitness on the part of the practitioner, was still in the pelvis; and the parent suffered little from hæmorrhage. Several cases of a similar nature are related in the essay on the present subject, by the late Mr Rigby. It may

be presumed, that in these cases, the fatal event must have been prevented by the quick descent, and consequent pressure of the body of the child upon the point whence the placenta had been detached.

In hæmorrhage, after the birth of the fœtus, but prior to the expulsion of the placenta, some recommend the introduction of the hand, for the immediate removal of the mass. It seems a more judicious practice, however, and one which the author has long adopted, not to proceed thus abruptly to remove it, at least for a reasonable period; but first, if possible, to endeavour to effect its expulsion by indirectly stimulating the uterus by the exhibition of cordials, the ergot, and frictions on the abdomen. The retention of the secundines, until the uterus can be excited to act, must moderate the effusion, by partially blocking up the unprotected extremities of the bleeding vessels. When the flow is copious, and the case urgent, a powerful, though apparently harsh mode of arresting it, is, to grasp the uterus firmly through the abdominal parietes. With this must be combined, the occasional exhibition of ergot, and ardent spirits; while the abdomen, pudendum, and thighs, are to be frequently spunged with cold water. Frictions, and pressure upon the abdomen, when perseveringly exerted, will be found of the utmost importance in every case of hæmorrhage. Liquids of every other description, except the ardent spirits, are to be sedulously abstained from, lest vomiting might be excited, which would certainly defeat all our measures, from the relaxation superinduced.

Flooding after the removal of the placenta requires to be similarly treated with that which precedes its expulsion. If the passages be charged with coagula, the womb must, if possible, be excited to effect their ejection, without the introduction of the hand, which should be the last alternative. As in cases where the secundines are still in utero, so also in examples where they have been extracted, but where the passages are loaded with clots, these are not immediately to be removed, since their presence must moderate the effusion. We sometimes find the uterus so relaxed, that it is quite insensible to all ordinary kinds of irritation, and particularly to the long-vaunted pressure of the clenched hand, applied on different points within its cavity. In a case of this description which happened to a poor woman, whom the author attended some years ago with his pupils, he was induced, after every other remedy had proved ineffectual, to throw into the uterus, while his arm was in the vagina, four ounces of the volatile spirits of turpentine, and twelve of

cold water, mixed, which produced contraction, whereupon the hand was withdrawn, after having been nearly four hours in the uterine cavity. Opium, in large doses, has been recommended from high authority, in flooding; but whoever, in such a case, exhibits this drug, must strangely mistake its action and application. Wherever it is necessary to *allay* uterine action, as for example, when turning is required, opium in large doses is our sheet anchor; but where our object is to excite the womb to action, its exhibition is obviously preposterous.

When the uterus has been excited to contract, such steps are to be adopted as are likely to secure the organ in this state. A compress, of such size, is to be placed over the uterus, as shall, in conjunction with the binder firmly applied around the abdomen, exert considerable pressure on the relaxed organ. Camphor, to the extent of ten grains, blended in a little almond emulsion, should be exhibited frequently in the course of the day; calf's-foot jelly, soups, and a little brandy, are to be given internally; and as the temperature of the limbs is sure to be much reduced, it is to be supported by means of artificial warmth, as heated bricks, or irons, and bottles containing hot water.

This section cannot be brought to a conclusion, without noticing, an old remedy recently revived, viz. transfusion, In this practice the author has no experience whatever; but, judging from the cases that have been recorded in the periodical literature of our profession, he must say, that only the safety of the remedy has been substantiated; but that in no one example he has read, has its utility been established; while it is very obvious, that some females underwent the operation of transfusion in whom such a measure was not indicated. Were it not that it might seem a misapplication of labour, the author might easily confirm the opinion he has now advanced, by quotations from the cases themselves.

When a profuse discharge takes place in the puerperal state, whether from premature or powerful exertion, compression upon the abdomen, quiet, some doses of the acetate of lead with opium, and free ventilation of the apartment, will assist in restraining it. Cold applications are, if possible, to be dispensed with, lest they might lead to too early and sudden suppression of the lochia.

Sect. III.—*Puerperal Convulsions.*

Young, full, and robust females, with those who are for the first time pregnant, seem the most disposed to convul-

sions; and though they may be observed in all seasons, yet they are most frequent in summer. In the parturient state, there are several conditions of the system which may be viewed as powerful predisposing causes; *first*, that sensibility of the nervous system, which prevails more or less throughout gestation; *secondly*, the general plethora, which is a natural concomitant of pregnancy; and, *thirdly*, irritability and congestion of the cerebral system in particular.

Among the exciting causes, many have been enumerated which are certainly more imaginary than real, as the undue use of tea and coffee. With greater certainty, however, we may place under this head whatever has a tendency to increase the momentum of the circulation to, or impede its return from, the brain: to the causes which may be considered of this nature, may be added great excitement, or high irritation of some other organs than those of the uterine system. To the first of these must be referred the mental passions, as violent anger.

The free return of the blood from the head may be impeded by the reiterated contraction of the abdominal muscles, and consequent pressure of the uterus upon the subjacent portion of the aorta; the frequent excitement of the respiratory organs; narrowness of the pelvis; and accumulation in the lower part of the intestinal tube. Convulsions appear more frequently during the second stage, than at any other period of labour, from obstructed circulation in the large vessels which traverse the pelvis, and the irritation arising from pressure on the pelvic structures. Extraordinary bulk of the uterus has been enumerated among the exciting causes; but the author has never seen this affection in those cases where there was a preternatural quantity of liquor amnii, and only once in plural births, where it evidently arose from mental excitement. Among the local irritations that have been known to produce convulsions, that arising from the distension of the vesica urinaria has been mentioned, and an example of this kind is related by Lamotte.

As to the pathological state of the brain in which this complaint consists, the most rational view is probably to consider it a condition somewhat analogous to that of apoplexy. By this is not meant to be understood over-distension of vessels merely, which can only be considered as a powerful exciting cause, but a state of high irritation, or excess of morbid irritability. There is scarcely an instance of this affection but what is preceded, for a period of more or less time, by certain morbid phenomena within the cranium before a paroxysm is developed. The fits may be partial or general;

of the former, we have frequent examples in those spasms which seize the sacral limbs during parturition. Convulsions have been known to attack some individuals during several successive labours; of which examples are related both by Baudelocque and Capuron.

The symptoms which precede them, strongly corroborate the above suggestion regarding their pathology. For several days preceding the attack, in some cases, the patient complains of vertigo and impaired vision, with a sense of painful tension and throbbing within the cranium. Frequently these sensations, unless very troublesome, are not mentioned by an individual who is on the eve of being in labour, for her mind is wholly occupied with this more important event; until at last, a violent headache, an increase of the vertigo and throbbing, with flushing of the countenance, command greater attention. Convulsions occasionally appear before labour is established, at other times this function is ushered in by fits, or they supervene when the fœtal head is advancing through the brim. Occasionally, however, a paroxysm forms without any previous warning or obvious cause. Frequently, the muscles of the atlantal extremities are among the first to exhibit evidence of inordinate action, by being seized with involuntary movements. To this precursor, distortion and suffusion of the countenance quickly follow. The vessels of the neck appear distended, and the arteries throb violently. At other times, the first complaint which the patient makes known, immediately before the fit is ushered in, and while she continues sensible, are seeming sparks of fire before the eyes.

During the paroxysm, the most fearful symptoms are developed in quick succession. The eyes seem protruded from the orbits; are at one time widely opened, fixed, and distorted; and at another opened and closed in rapid alternation. The mouth is drawn to one side, and gives exit to sanguineous froth; the lower jaw is suddenly depressed and elevated, occasioning great injury to the tongue, which is often protruded. In severe cases, the head is either drawn backwards upon the spine, or pushed forward upon the chest. Respiration is hurried and stertorous, and all the muscles concerned in this function are violently excited. Labour pains become powerful and irregular. The action of the muscles of the extremities, in particular, is so violent, that the noise occasioned by the heads of the bones striking against their sockets may be distinctly heard; that produced by the sudden snapping of the lower maxilla, is fearful; while in other cases, as stated by Gardien, luxation of an extremity has taken

place. Some of the sphincters do not escape; that of the anus is so affected, as to resist the passage of an enema pipe, while, from the same state it is sometimes very difficult to pass a finger per vaginam.

In the commencement of this malady, and, indeed, until after the fits have been several times renewed, the patient hears and understands all that is said during their continuance, but she does not possess the power of utterance. After the frequent recurrence of convulsions, however, the sufferer is deprived of hearing, recollection, and intelligence; and where recovery has taken place, even several days elapse before these faculties are restored. Sometimes after only one or two paroxysms, the senses are so much obtunded, that the woman thinks she had been asleep, and enjoys no recollection of what had happened during the attack. An increase of temperature and of the momentum of the circulation, results from the excitement of muscular action; and this is followed by tension of the cerebral vessels, increased irritation of the organ itself, and an aggravation of the fits.

When the convulsion ceases, the urine and fæces sometimes escape involuntarily, owing to that relaxation which too often succeeds violent excitement. The patient sinks into a state of somnolency or torpor, in which she continues, snoring uncommonly, until she is roused by another fit. If, betwixt the pains of labour, a woman is observed to snore loudly, and sleep profoundly, she should be attentively watched, as these symptoms have often been observed to precede the spasms. The duration of the fits is variable; the author has not seen them continue longer than twenty minutes in any instance, while in some he has known them to be concluded in less than half that time. Though they may become more violent, they are not always protracted as they recur; for sometimes a short succeeds a long paroxysm.

Convulsions may be easily distinguished from several affections which resemble them, as hysteria, epilepsy, and catalepsy. In the first of these, the senses continue unimpaired; the patient can see, hear, and be made to swallow medicine or nourishment during the fit, which cannot be accomplished in convulsions; nor, like them, does hysteria terminate by somnolency. The paroxysms in epilepsy are rarely renewed oftener than once in twenty-four hours, they are seldom so violent as convulsions, the patient makes a squeeling noise during their presence, and though they terminate by somnolency, yet the sleep is unaccompanied by that stupor or noise which is present during the latter, and when the patient awakes, she is free from every complaint except lan-

guor; moreover, the *aura*, when present, is a marked distinction of epilepsy. In catalepsy, as in convulsions, certainly the fits are frequently renewed, but there is a marked difference betwixt them; in the former there is no agitation, or no foaming at the mouth, but total want of consciousness during the paroxysm; whereas, in the latter, though the agitation be great, yet until the fits have been often renewed, some degree of perception remains. The singular condition of the muscles which enables us to place the limbs or the trunk in any particular position, and in which they will remain while the fit continues, sufficiently distinguishes catalepsy from every other disease.

Convulsions in the parturient state, though terrific in appearance, are not in reality formidable, when early and properly treated. This is proved by the result of the practice adopted on the continent, where such cases are not so actively treated as in this country; and where it has been candidly acknowledged, that in spite of energetic measures, they had at La Maternité almost as many fatal as successful cases. I have seen but two fatal examples of a number in which I have been concerned. When the fits are frequently renewed, continue long, and are followed by great insensibility or deep coma, a guarded opinion should be offered. Short paroxysms, unaccompanied by any considerable degree of torpor, need not create apprehension under active treatment.

When the event is fatal, it has been usual to ascribe this to one of two causes, viz. rupture of some vessel within the cranium, or of the uterus. Sometimes, however, as was verified in the only post-mortem examination which I witnessed, there is nothing to account for what has happened. A little serous effusion may be found in the ventricles; congestion of the veins and sinuses; or some portions of the brain softened, or unusually red.

In the treatment, there are two very obvious indications to be fulfilled; *first*, to diminish irritation of the nervous system; and, *secondly*, that of other organs. The most effectual mode of relieving the general excitement of the nervous system is by venesection, a practice which, in this country at least, has, for many years, received the sanction of every man of standing in the profession; and one which, under ordinary circumstances, should take precedence of every other. Venesection must be performed, and the blood allowed to flow from a large orifice, until a marked impression be made on the pulse; the quantity abstracted is of minor importance, it is the effect produced that we are to consider; syncope must

be induced, or nearly so, before we desist. This practice may not prevent the return of the fits, but it will assuredly moderate them. In one remarkably stout unmarried female, eighteen years of age, where labour commenced with violent convulsions, she was bled from both arms at once with the most gratifying results: for, from being quite unconscious, she was not only delivered unknown to her, but also of a living child.

Convulsions will recur not only during the passage of the fœtus through the pelvis, but even after its complete separation from the parent. Sometimes there are no fits either previously to, or during labour; but they may supervene thereafter at the lapse of days. In one patient for whom the author was consulted, convulsions appeared on the second, and in another on the seventh day after delivery. When the general abstraction of blood to a due amount has not been attended with the desired effect, leeches or cupping must be employed. I have witnessed the happiest effects in several instances from the latter on the occiput and neck, and my conviction is, not only from my own experience, but supported by the testimony of Mr Cafe, who has the principal practice as a cupper in this city, that this plan will afford relief more speedily and with the abstraction of a smaller quantity of blood, than by opening the brachial veins. The head should be closely shaved, left uncovered, and frequently spunged with cold water. It is impossible to say in any case to what extent it may be necessary to abstract blood; the author however once witnessed an instance in which seventy-eight ounces were removed in a very few hours by the lancet; but it was not until eighteen ounces more were obtained from the occiput and neck by cupping, that the fits subsided. In less than ten hours after delivery even, this patient had five violent convulsions; and she continued partially deaf and blind until the cupping had been practised. When the fits recur, a compress of soft linen must be placed betwixt the jaws to guard the tongue from injury.

With the abstraction of blood, Antimonial Tartar, in nauseating doses, should be conjoined. Dr Collins employed it extensively and with great advantage while master of the Lying-in Hospital, Dublin, and the profession are indebted to him in an especial manner for having directed their attention to its utility.

During parturition, a strict investigation must be instituted, to determine whether there be any cause resisting delivery, as rigidity of the os or cervix uteri; induration or callosity of any part of the vagina; or an unyielding condition

of the external parts; under which circumstances, the practice that has already been laid down, will fulfil the double indication of relieving the cerebral system and inducing relaxation of the passages. As over-accumulation in the rectum and bladder may impede the descent of the fœtus and lead to much irritation, the necessary steps are to be adopted to get rid of these obstacles.

As next to that of the cerebral system, the principal source of irritation must be the pressure exerted by the fœtus in its transit *per pelvem*, it comes to be a question whether the delivery should be accelerated artificially, or left to be accomplished by the efforts of nature. If the excitement produced in the general system by the parturient efforts, together with that irritation arising from the long-continued pressure of the child on organs of importance, tend to the development of fits, and to support them after they have appeared, of which there cannot even be a doubt, we are imperiously called upon to accelerate delivery. When this can be done safely, it is, to say the least of it, fatuous to inculcate an opposite principle. The safety of the fœtus, to which convulsions may prove as fatal as to its parent, is an additional reason for hurrying the delivery. Parturition is accelerated by venesection alone, since it conduces to relax and dilate the maternal passage. Whenever the head is within reach of forceps, and the passage prepared, the fœtus should be cautiously extracted; or if there be not sufficient space for its transit, or for the extracting instrument to be applied, embryotomy, after having determined, by prudent delay, what the powers of the parent can accomplish, must be resorted to. However much such an alternative is to be deplored, it is not to be put in comparison with rupture of the uterus, or cerebral effusion, either of which must happen by unwarrantable delay.

When convulsions continue to recur after delivery, if the head has not already been shaved, this precaution must now be adopted; a large blister applied so as to extend over the neck and between the scapulæ; the head to be covered in frequent succession with thin compresses immersed in cold water; the bowels to be freely acted on every alternate day; the sedative solution of opium ordered frequently in large doses; the chamber obscured, but freely ventilated; and the strictest quiet observed throughout the dwelling.

Sect. IV.—*Rupture of the Uterus.*

These cases impose as great a degree of responsibility on the practitioner, as any description of patients that can come

within his province. Though such accidents must have happened as well in early ages as in the present day, from the rude manner in which assistance was afforded to the sex under such difficult circumstances, yet it was not until the 15th century, that they were particularly described by our continental brethren; and since this period they have often been recognised by our own countrymen. The accident may happen at any period of pregnancy almost; and from the commencement of parturition to the close of the process; but the second stage of labour is the usual time. The most frequent predisposing causes on the part of the parent are, malformation, or general confinement of the pelvis, and softening of the uterine parietes. This last condition was first mentioned by Boer in 1812, and lately particularized by Dr Radford of Manchester, in a fatal case of rupture of the uterus, which he published.* Enlargement of the cranium from disease or overgrowth, may predispose to the accident on the part of the fœtus. Females, though required to make stronger and more protracted efforts in their first, are not however so liable to the accident as in their subsequent labours; thus of 34 instances recorded by Dr Collins, seven were first deliveries; of a collection of 29 cases in the Med. Surg. Jour. Edin.† one only was a first labour; and Dr Ramsbotham states, that of a number of such cases to which he had been called, two only were first labours. That some change in the uterine tissues in consequence of frequent child-bearing may predispose to the accident, is satisfactorily proved by its greater frequency in females who have had several children. The sex of the child too would seem to have considerable influence in producing the accident; for in 20 cases related by Dr M'Keever 15 were male children; and in 34 by Dr Collins, 23 were males. This difference is readily explained by the fact of males being about a thirtieth part larger than female children, as was shown by the late Dr Joseph Clarke. Of 8 cases with which the author has been connected, seven happened among the humbler classes, corroborating an observation by Dr Rigby, that these are more liable to it than females of the better ranks, from their being more exposed to accidental violence, and oftener attended by unskilful persons.

The occasional causes are not so numerous as they were at one time supposed to be. Extraordinary motion of the child, violent uterine action, external injuries, as falls, blows, and bruises; and the improper application of instruments, have all been mentioned. To the number may certainly be

* Med. Surg. Jour., London, 1832. † Vol. xlii. p. 50.

added, incautious proceedings in performing the version of the fœtus. Of all these, the second cause is the most influential; the first seems more imaginary than real; and although there are many instances recorded, where females in a state of pregnancy have suffered severe corporeal injuries from falls, blows, and similar accidents, yet the uterus, for reasons which have already been sufficiently explained, escaped unhurt. Several examples have occurred in the practice of the author, where females of irregular habits have tumbled down one or more pairs of stairs, without any detriment either to the parent or fœtus; but he does not mean to assert that this is the invariable result. In the Dict. de Sci. Méd. many cases of rupture of the womb are related, and among the number, one in which it occurred in consequence of a woman having been squeezed between a carriage and the wall of a house.

The action of the uterus may be violently excited by premature rupture of the membranes, and by obstruction to the transit of the fœtus, owing to its head being enlarged by disease or preternatural growth, or from the pelvis itself being generally contracted or deformed. When a breach of continuity takes place in the womb, it may be accounted for in three different ways; *first*, the organ may be abruptly torn where there is softening of its structure; *secondly*, its parietes at some particular point, by being exposed to the pressure of the head on the inside, and an exostosis, or the brim of the pelvis on the outside, become progressively attenuated, and ultimately give way; or, *thirdly*, this pressure may give rise to inflammation and ulceration, and these changes may be succeeded by laceration; but it does not appear that the latter mode is frequent. The injury may be limited, *first*, to the substance of the uterus; *secondly*, to the peritoneum only, which may appear at many points as if fissured; or, *thirdly*, the substance of the uterus and peritoneal tunic may be simultaneously torn; which last, as might be inferred, is the worst variety of the accident. Most frequently by far, the injury is confined to the cervix; and it may involve a portion of the vagina, as happened in the only successful case of the eight which came under the notice of the author. The laceration was in the posterior part of the cervix and upper extremity of the vagina, and although the patient recovered, yet she had coffee-coloured vomiting, and a considerable protrusion of the intestines into the pelvis, in which, however, they were not to be discovered on the fourth day after the accident.*

* Med. Surg. Journ. Edin. 1828.

The rent may take place at any point of the uterus, and pursue an oblique or transverse direction. A laceration in the anterior is somewhat less frequent than in the posterior parietes of the organ; and more rarely still toward either side. Of thirty-six cases, in one instance the injury involved nearly the whole circle of the cervix,—being connected to the vagina merely by a thread; in eleven of the number the injury was posterior, in eight anterior, in five lateral, in three anterior lateral, and in three posterior lateral.* In twenty-eight of the thirty-four cases recorded by Dr Collins, the rupture in thirteen of the number was in the posterior, and in twelve in the anterior parietes; in two laterally; and in one, the os uteri was torn.

It is of the first moment to be able to distinguish the symptoms which characterize a threatening of this formidable accident, since it is then only that we can in many cases benefit the patient. It is a very proper precaution, in every instance in which a practitioner is engaged to attend an individual who has formerly had a family, but with whose history he is in other respects unacquainted, to enquire into the nature of her sufferings during parturition; and if it appears that her deliveries have been protracted, and that she has given birth to still-born children, she should be watched with more than ordinary care. We must also be unremitting in our attendance, when the parturient efforts are violent, without advancing the fœtus after the os uteri is well dilated; when the pains seem chiefly centred in the pubes or sacrum, and when they are almost unremitting; when a crampish sensation in the abdomen is complained of, during the short intervals betwixt the pains; and when there is great restlessness and flushings of the countenance. It is to be remembered, however, that these precursors are not always present. The author was once concerned in a case where the woman had not been more than four hours and a half in labour, when the accident occurred, though the pains had not been by any means powerful.

We can speak with far greater confidence regarding the symptoms which denote the presence of rupture of the uterus. Whenever it happens, a sensation is communicated to the woman of something having given way within her; and so obvious is this feeling, that patients have declared they heard a noise at the time.† Excruciating pains are felt, not only in the immediate part, but over the whole abdomen;

* Med. and Surg. Journ. Edin. vol. xlii.

† Observat. on Rupt. of the Uterus, by A. Douglas, M.D., p. 64. Dr Dewees' Compendium, p. 563.

and they are aggravated on pressure. If the injury be in the body of the womb, the parturient efforts cease; but if in the cervix, they continue, though in a partial degree. Blood is effused, *per vaginam*, in a profuse or limited quantity, according to the proximity of the injury to the placenta, and the extent to which the brim of the pelvis is occupied by the fœtal head. The presentation immediately recedes, except when the cranium is wedged in the brim. The appearance of the countenance is well worthy of remark; it becomes pale, anxious, and collapsed. The pulse is rapid and indistinct. A vomiting of dark-coloured fluid, like the grounds of coffee, the result of relaxation of the sanguineous vessels terminating on the surface of the stomach, soon follows. If the peritonæal coat of the uterus has been lacerated, the fœtus, when the rent is extensive, escapes among the intestines; and a hand placed on the abdomen can distinguish its limbs and other parts, through the parietes; also, when the lining membrane of this cavity is injured, the effusion from the lacerated uterine vessels, will escape into the peritonæal sac, and little blood will pass *per vaginam*. When the case is suddenly fatal, the patient is carried off by convulsions, or dies exhausted from loss of blood.

It is scarcely necessary to observe, that these are very formidable accidents. The danger is in proportion to the time which has been permitted to elapse, before the sufferer has received proper assistance. Profuse evacuations of blood *per vaginam;* the escape of the fœtus from the uterus into the abdominal cavity; the total cessation of uterine action; protrusion of the intestines *per vaginam;* black vomiting, convulsions, and syncope, are all ominous symptoms. When a patient has been early visited, and properly assisted; when uterine action is present, even in a trivial degree; and when the pulse is firm and distinct, hope may be entertained. Some individuals had so favourable a recovery that they have been known to conceive after the accident.*

The author has known a patient die in nine hours after the accident; but there are cases recorded where life has been protracted for days or weeks after it. Death may be ascribed to a variety of causes besides hæmorrhage; as inflammation of the peritonæum arising from this tissue having been lacerated; or from irritation produced by an effusion of blood, or of liquor amnii, or the escape of the fœtus itself into its sac. In some cases, death has been owing to the protrusion of a portion of intestine into the uterine rent,

* Dr M'Keever, p. 41. Dr Ramsbotham's Princip. and Pract. Obstet. Med. &c. p. 595. Med. and Surg. Journ. Edin. vol. xlii. p. 53.

and consequent strangulation.* An extraordinary instance is related by Dr M'Keever of Dublin, in which four feet of intestine protruded and sloughed away through the uterine rent, after which the woman had a complete recovery. For nearly two years afterwards, she voided all the fæces *per vaginam;* at the conclusion of which period, they resumed their natural course, and in little more than two years after this unexpected change, she produced a living child at the full time. Of eight cases of this accident in the practice of Dr John Clarke, one recovered; of five cases recorded by Dr Blundell, all proved fatal; two in thirteen recovered by Dr M'Keever; two in thirty-four by Dr Collins; two in eight by Mr Ingleby; two in nine by Mr Roberton; one in eight by the author.

When symptoms arise which characterize a threatening of this accident, an attempt must be made to moderate the action of the uterus, that the fœtal head may be more progressively moulded to the pelvis, or that an interval of ease may be procured, to enable the practitioner to adopt such measures as circumstances may require. This object we endeavour to attain by premising venesection, which must be carried the length of causing a tendency to syncope, after which a very large dose of the tincture of opium must be administered. Should success not attend these remedies, as a *dernier resort*, the influence of intimidation should be tried. The practitioner may give some hints as to his apprehensions of a rupture of a blood-vessel; which stratagem, from the powerful influence of the mind on the uterine system, may be attended by the happiest results.

When the womb has actually been injured, let it ever be impressed on the mind, that nothing but early delivery can save the sufferer; and how this is to be effected, must be determined by the particular circumstances of the case. If rupture of the uterus takes place while we are in the act of turning, the practitioner must proceed to bring the delivery to a conclusion as he had at first resolved; and the same proceeding must likewise be adopted, when the accident occurs before the os tincæ is sufficiently prepared to permit the transit of the head, but where the aperture is dilatable. When the womb is lacerated in consequence of the descent of the fœtus being impeded by disproportion betwixt it and the pelvis, an exostosis, or tumour, embryulcia must be performed, unless the pelvis be sufficiently capacious to allow the head to pass, when it is to be embraced and brought along

* Baudelocque by Heath, vol. iii. p. 418.

by forceps. It is my firm impression that although turning has been directed under such circumstances, yet in every instance, where forceps, long or short, can be applied, it is a mode of delivery which ought to be preferred. It must be obvious that so great a change in the position of the fœtus, as must be brought about by turning, cannot be effected without increasing the rent, and rendering the condition of the patient more critical than formerly.

When the child escapes through the breach in utero, into the abdomen, three modes of practice are recommended; *first*, to draw the fœtus back into the uterus, and thereafter extract it, per vaginam; *secondly*, to leave matters to nature; and, *thirdly*, to accomplish the delivery by gastrotomy. In regard to the *first method*, its success has been such as to discourage us from its adoption, since of twenty-six cases collected by Dr Douglas, in which it was pursued, only four, as admitted by himself, recovered: the first of them is his own, the accuracy of which was disputed by Mr Goldson; the next two are foreign cases; and the details of the fourth are of such a nature as to render its accuracy more than questionable. Doubtless there are examples related, where we are informed the fœtus has been brought back into the uterus, and thence extracted per vaginam, after having been many hours, or several days even, lodged among the intestines; but the author is disposed to believe, that in these instances, the injury was not in the body, but in the cervix uteri, and upper part of the vagina, points which are far less contractile, and of which a laceration is not so formidable, as of the upper parts of the organ.

In support of the *second* method, cases have been published where the child, after its escape from the uterus into the abdominal cavity, was permitted to remain therein for years without inconvenience to the parent, who, at some ulterior period, got rid of it by the suppurative process, or who indeed conceived again during its retention, and who, after all, had a complete recovery. Admitting that some individuals have recovered under such extraordinary circumstances, what does this prove; merely that nature is occasionally capable of making efforts for the support of our frame, which could never have been contemplated; and that, although, in some rare instances, women may have survived such complicated tortures, yet, that we should not be justified in trusting such cases to the powers of the system, since it is well known that a large majority of them have sunk under the most painful and protracted sufferings.

The third method, though very formidable from its near re-

semblance to the Cæsarean section, would seem, however, to have been attended with most success. In the Journal de Médecine, vol. iii. for 1768, the first well authenticated case of recovery will be found. The child was still-born. A second successful instance, in which a woman had been twice operated on, is detailed in the Pathol. Chirurg. vol. ii. The second time this expedient was resorted to, the child continued to live half an hour after its extraction. A third successful operation of this nature is related in the Quarterly Journal of Foreign Medicine, vol. ii. The patient had not been operated on for twelve hours after the occurrence of the accident. The fourth successful instance, in which both the mother and child were saved, is detailed in the Edin. Jour. Med. Sci. vol. i. From these cases, the author considers himself justified on every occasion in which the extraction of the fœtus has not been attempted almost immediately after the accident, to recommend the section of the abdominal parietes, in preference to either of the other methods. The same practice should also be pursued when the womb has been injured, and the fœtus has escaped among the intestines, before the uterine aperture has either become dilatable, or has been expanded to a sufficient extent to receive the hand, with a view to turning. Where an effusion of liquor amnii or of blood has taken place into the peritoneal sac, this is a further inducement for performing gastrotomy. *Lastly*, where, after the removal of the fœtus by the natural passage, a portion of intestine protrudes through the breach in the uterus, and where this organ has contracted to such an extent that the hand could not be received to reduce the pro truded viscus, Pigrai, the friend and pupil of Ambrose Paré, recommended the section of the abdominal parietes, which, though the event in the case recorded by Dr M'Keever was successful, seems unavoidable.

Finally, as in some females who survived rupture of the uterus, the same accident has been known to happen to them in their succeeding labours, it has been proposed, in 1709, by Dr Douglas of London, as stated in a former place, to extract the fœtus by the feet, in women who had once been thus unfortunate; and the proposition is one which has frequently since been acted on with success.

Sect. V.—*Protrusion of the Funis.*

This, fortunately, is not frequent, as it is very annoying in practice, since the fœtus is very generally lost. In primary labours, indeed, too often, the earliest interference will

not save the infant, which is destroyed from pressure on the cord during the extraction of the head from the outlet. If we act upon principle, there is little to be apprehended for the parent.

A presentation of this kind can only be met with where the funis is long, and none of it entwined round any part of the fœtus. Such cases are recognised, in most instances, before the labour is at all advanced, by the funicular feel of the presenting part and its pulsation. Sometimes, however, the cord does not present until the membranes are ruptured, when it is carried down with the head or other presenting part by the current of the liquor amnii, when this is copious. Boer of Vienna considers relaxation of the lower segment of the uterus as the chief cause, by permitting the descent of the funis; but if this notion were correct, such cases ought to be of frequent occurrence, since in every instance where a considerable portion of the cord lay loose in utero, it would protrude in the absence of contractions. Levrèt, again, with that exuberance of imagination so characteristic of his countrymen, supposed that the approximation of the placenta towards the cervix or os uteri, predisposed to funicular protrusions; but our friend Dr Rigby, even though almost an idolater of continental midwifery, is not very favourable to this supposition; and for ourselves, we can aver that we never met with a presentation of the funis under such circumstances.

Of all the methods proposed for managing these cases, as removing the protrusion to some unoccupied point of the pelvis, pushing it above the brim, and hooking it upon the feet of the fœtus; turning, when the passages are prepared, the labour not too far advanced, and the patient has had children formerly, is decidedly the most proper; but this practice is not unexceptionable. In a primary labour, while changing the position of the fœtus, we may rupture the uterus from its unyielding condition; or, admitting that it has escaped uninjured, there is still another objection to this method, which is, that the child may be lost during the extraction of the head, from the resistance opposed to it by the rigid state of the external parts. We are justified, however, in trying it, more especially if there be plenty of liquor amnii; but one knee only is to be brought down instead of both legs, in order, by the retention of the other limb, that the os externum may be more expanded, and the fœtal head more readily extracted.

When a practitioner is called to a labour where the head is so far advanced into the pelvic cavity that it would be

unsafe to attempt turning, the passages prepared, and the patient has been the mother of a family, the application of forceps to accelerate delivery, is unquestionably the best practice, since expedition or procrastination, by a few minutes only, might lead to the preservation or destruction of the fœtus.

A method somewhat recently adopted, but very differently spoken of by two of the most experienced practitioners of this country—Drs Collins and Ramsbotham, jun., is pushing the funis above the brim, and preventing its descent by a piece of sponge; but my experience in the application of this expedient would not justify me in expressing myself with confidence either for or against it.

The last mode adopted for effecting the reposition of the cord, and which has been highly eulogised, originated with Dr Michaelis of Kiel. He employs a strong elastic catheter, from 12 to 16 inches in length, open at both extremities, furnished with a double silk ligature, of which a loop should protrude at the upper extremity of the instrument. The catheter is to be advanced into the vagina; the ligature passed through the coil formed by the funis, and thereafter drawn down to the os externum. A stilet with a wooden handle is passed within, until it projects beyond the extremity of, the catheter; the loop of the ligature is suspended upon it; and thereafter it is drawn back into the instrument, and pushed up to the end. The practitioner has now merely to draw down the extremities of the ligature, whereby it is slightly tightened, after which the catheter is advanced to the funis, which will now be securely fixed to the extremity of the instrument. After reposition has been effected, the stilet is to be withdrawn, whereupon the funis will be disengaged; but lest injury might arise, the ligature is first to be withdrawn, and thereafter the catheter.*

Sect. VI.—*Unusual Capacity of the Pelvis.*

Superficially considered, this state might be thought favourable for child-bearing, but a more attentive examination of the subject cannot fail to detect its inconvenience. When the pelvis is unusually large, the individual is observed to waddle in walking; her abdomen to be less prominent than that of other females, in the latter months of pregnancy. Such a condition of the pelvis is not very liable to give rise to any unpleasant consequences during a first labour; but in an indi-

* British and Foreign Med. Review, vol. i. p. 588.

vidual who has given birth to one or more children, it may be attended, from violent action of the abdominal muscles, or of the womb, either during gestation or parturition, with prolapsus uteri; and in the latter state, with the abrupt or unexpected expulsion of the fœtus, and consequent injury to the perinæum.

When such a condition of the pelvis is known to exist, the patient, when near the termination of her pregnancy, should be cautioned against active exercise, or going abroad, lest the infant might be unexpectedly thrown from the passage.

Should there be a disposition to prolapsus uteri during labour, or should the head, surrounded by this organ, be advanced into the pelvic cavity during this process, it is sure to protract it, and increase the sufferings of the patient. In such a case, the head must be supported by two fingers introduced into the vagina, until the uterus, by its own contractile power, recedes upon the brim. If the whole gravid organ be found *extra vulvam*, we are not, as some have advised, to reduce it immediately; for, in most cases, incalculable mischief would arise from attempts to force it back into the pelvis. Its reduction is to be deferred until the fœtus has been disengaged; but in the mean time, it is to be enveloped in a soft towel, with such a degree of firmness as shall aid it in dislodging its contents; after which, it is immediately to be replaced. The emancipation of the child is to be accelerated by the reiterated application of unctuous matter to the os uteri, which, when dilatable, is to be cautiously expanded by the fingers of the practitioner.*

Sect. VII.—*Herniæ.*

Those liable to be met with, are the umbilical and vesical. Such as are observed about the brim of the pelvis, the groins, and the pudendum, disappear as gestation advances. The vesical rupture is a mere descent of the organ, which, when the urine is suffered to accumulate during labour, is forced into the pelvis, or caused to protrude between the vagina and the pubes, at the vulva. This kind of tumour is recognised by its being attached to the front of the pelvis, by the superinduction of pain, an inclination to void the urine when it is pressed upon, and by its retirement after the catheter has been employed. This last measure is all that is required during parturition; and its adoption is not to be

* See page 303.

neglected, lest the organ might be injured during the descent of the head.

So far as the author has observed, protrusions at the umbilicus or in its neighbourhood, or in the course of the linea alba, from that disunion of the parietes which occurs occasionally, have no influence in retarding the progress of labour. When such a state is known to exist, the viscera should be restored to their proper cavity; and during parturition, a broad roller or bandage applied round the abdomen to afford support to its parietes.

Sect. VIII.—*Retention of Urine.*

This is among the least frequent complications to be met with during parturition; for such a state is prevented by the irritable condition of the bladder, from its sympathy with the uterus. When present, it is recognised by urgent micturition, pain, tension and swelling in the hypogastric region, and increased uneasiness either from pressure, or during uterine contraction. Retention may be owing to paralysis of the vesica from inattention to the calls of nature; from the head being impacted in the pelvis; and from the urethra being blocked up by calculi or ropy mucus.

When there is much excitement of the parturient organs, and the determination to the skin consequently free, many hours may elapse before such distension of the vesica urinaria can take place, as shall at all interfere with the progress of labour. From whatever cause the obstruction has arisen, exit should early be given to the contents of the bladder, lest the accumulation might oppose the descent of the fœtus, or lead to inflammation and rupture of the distended organ,—accidents which the reiterated contraction of the abdominal muscles must tend to accelerate. The catheter must be used without delay; and it rarely happens that it cannot be introduced, even without pushing up the head, which can seldom so completely occupy the depression behind the pubes, as to prevent the introduction of the instrument. If the pelvis is so completely filled, however, that the catheter cannot be advanced, and the head so locked that it cannot be elevated in the brim, forceps must be tried, and the delivery speedily accomplished. But if this mode also cannot be followed, though it may be presumed that so many obstacles will rarely be encountered, the practitioner then has a choice of two evils,—to puncture the bladder if the fœtus be advancing though ever so slowly; or to use the perforator when the head is immoveable. When the trocar can reach

the vesica from the vagina, this operation should be preferred; but when it cannot, the organ must be punctured above the pubes—a mode that cannot be attended with greater risk than paracentesis abdominis, which has often been performed in the gravid state without detriment to the patient.

Sect. IX.—*Monstrosity.*

The only conditions, usually denominated monstrosities, that are mentioned by practical writers, as at all likely to interfere with the ordinary duration of labour, are, enlargement of the head from disease, and the union of two fœtus. As infants have, however, been expelled under these circumstances, without any artificial assistance, the practitioner must always ascertain, by prudent delay, what the efforts of the parent are capable of accomplishing. When two children are united, and have arrived at maturity, since the volume of each is most generally less than if there were but one fœtus, instrumental interference in any shape is rarely required. But when the powers of the parent seem inadequate, and when urgent symptoms begin to show themselves, the extraction of the fœtus by mutilation, or otherwise, as the particular nature of the case may demand, must be practised.

PART THIRD.

THE PUERPERAL STATE.

CHAPTER I.

TREATMENT OF FEMALES IN CHILD-BED, AND OF THEIR ACCIDENTS AND INCIDENTAL DISEASES.

The young practitioner should be aware, that the responsibility which devolves upon him in his attendance on females in child-bed is very great, since they are liable to various morbid conditions, which, if overlooked but for a short period, are certain of bringing life into danger; hence unremitted attention for a certain time after delivery is indispensable. Important changes take place in the maternal system after the birth of the fœtus. The determination to the uterus is now transferred to the breasts, to furnish a secretion for the nourishment of the child. Great activity prevails in the absorbent system, without which we could not account for the uterus being so rapidly reduced to its pristine condition. The nervous system acquires fresh susceptibility, as is proved by the liability of the body to take on diseased action, from such trivial causes as would scarcely exert any influence in the non-puerperal state. The vessels of the skin also exhale freely, and assist those of the womb in carrying off the fluids which were employed during gestation, but which have now become superfluous.

A variety of plans of treatment have, at different times, been recommended for puerperal patients; but a little consideration of the subject is sufficient to show that no particular method can be generally applicable. Something must be granted to peculiarity of constitution, to former habits, to the degree of suffering which the patient may have endured in her labour, and to the season in which she is confined. It may be observed as a general rule, that those individuals will recover best in whose management little difference is made from their ordinary habits, if we except abstemiousness in diet and cordials, with strict tranquillity of mind and body.

After the secundines have been withdrawn, the practitioner is to retire from the patient's apartment, and all wet or

soiled clothing should be removed from around her; but the greatest caution must be observed in conducting this duty, more especially after a severe labour; and lest syncope or hæmorrhage supervene, the woman must not be raised into the sedentary position, as is too often done by nurses. The binder, which is a bandage sufficiently broad to extend from one or two inches above the umbilicus, over the spinous processes of the ilia, is now with uniformity to be applied round the abdomen by the sick-tender, in such a manner as to convey to the patient a feeling of support. This bandage being now in very general use in all spheres of life, pendulous abdomen is a condition very rarely observed. It also, by the stimulus of external pressure, promotes and secures the contractions of the womb, thereby diminishing the liability to profuse uterine discharge; it moderates the severity of after pains, and lessens the tendency to syncope. Except in cases of extreme exhaustion from the efforts of labour, the attentions now described, from their obvious importance, should be rendered to the patient with as little delay after the birth of the infant as possible; and to answer the object in view the more effectually, the nurse should be instructed to adjust the binder, and apply it a little firmer daily. Its use should not be abandoned while the lochia continues, since, besides the advantages already enumerated, it will afford support to all the subjacent parts.

The practitioner should continue in attendance for about an hour after delivery, and at his departure give directions to the nurse for the patient, after a suitable period has been allowed for repose, to turn upon her knees to void urine; to supply her plentifully with soft warm napkins for application to the vulva; and that the strictest quiet is to be observed throughout the dwelling. By the urine being voided as directed, and the napkins frequently changed, accumulations in the vagina, and excoriations of the external parts, are prevented. The latter sometimes prove exceedingly troublesome, and almost always arise from inattention. While the uterine discharge continues profuse, from four to six ounces of tepid milk and water should be thrown into the vagina, by means of a bag and pipe, three or four times daily. This simple precaution will moderate the effusion, accelerate the restoration of the uterus to its healthy condition, and discourage leucorrhœa with many hysteric complaints, which often have no other origin than protraction of the discharge in question.

Our next visit should not be delayed beyond twelve hours, because, if the parent has not succeeded in exonerating the

bladder, nor the infant obtained evacuations by stool or urine it may be necessary to afford assistance for the performance of these functions. The condition of the pulse must be attended to on this occasion, as also at every future visit; and so long as its rate is under ninety in a minute, the progress of the case may be considered favourable. We must likewise make inquiry regarding the uterine discharge, and if it seems to flow in the usual proportion, no interference is required. If the patient is to nurse, directions are to be given to have the infant applied to the breast, before our next visit. For the first week, she should be seen daily, and occasionally afterwards during the same period; but if the pulse, at any time during our attendance, should rise to ninety, she must be regularly visited till this condition has subsided.

When the individual has recovered from her fatigue, suitable nourishment is to be allowed. At first a little tea and toast, or panado, may be ordered. This diet, morning and evening, with some light soup for dinner, should be continued, for four or five days; and in a person who is confined for the first time, and who ought to follow an abstemious course, it will constitute sufficient nourishment. From this time, however, if she is to nurse, her support should be gradually rendered more substantial. In a woman who has formerly had a family, and who is to nurse, her diet should be more generous soon after delivery; after the third day, she may be indulged in a little animal food. But if the infant is not to be suckled by the parent, she must be restricted to a spare diet from the first, until the mammæ have ceased to increase. In regard to drink or cordials, too much simplicity cannot be observed in such articles. Medical men of the present day need not be informed, that too frequently a trifling indulgence in stimuli has led to painful results. A patient in her primary confinement, and more especially one who is not to nurse, should be restricted in fluids of every description, for the first week or longer, to prevent painful tension and abscesses of the breasts, which are not unusual when this caution is neglected. When thirst is urgent, where the free use of fluids cannot be permitted, fruit may be indulged in; and no description of it will answer better than grapes or stewed apples. If it should not be necessary to restrict the patient in this respect, barley-water, toast-water, milk-whey, or table-beer, may be allowed; but except after labours followed by general prostration, wine and malt liquors are not only unnecessary, but highly improper.

Under ordinary circumstances, aperients are the only medicines required in the puerperal state; and the most suit-

able are castor oil, neutral salts, compound jalap, senna, and enemata. For patients who are averse to any of these, laxative pills may be ordered, but they operate tardily, which is an objection to their use. The bowels are to be evacuated without fail, in the course of the second day after delivery; and in the case of a woman who has had several children, it is seldom that more than two or three doses of aperient medicine are required, during her whole confinement. After a first labour, the bowels should be freely open every alternate day, to prevent accumulation in the mammæ; and in an individual who is not to nurse, this practice must be rigidly observed.

Where the labour has been easy, it is customary to permit the patient to have her linen changed, and her bed made on the third day; or on the fifth, after instruments have been used. Few of the better ranks think of leaving their beds before the end of the first week, and they may be considered to have had a good recovery when they are enabled to do so at so early a period. Every female, in whatever rank of life, should be discouraged from making exertion with the pelvic limbs while the lochial discharge continues, for there is not a better proof that the uterus is unreduced to its original size, and liable to be prolapsed by the individual betaking herself too early to the erect posture. In the lying-in state, special attention must be paid to cleanliness in everything that regards the patient; her apartment must at all times be properly ventilated, and preserved as near as possible at the 60th degree of Fahr. ; visitors are to be strictly prohibited while she is confined to her room; nor must she be permitted, during this period, to take any share in the management of domestic concerns.

In the puerperal state, it has long been customary for those in easy circumstances to employ a professed sick-nurse, who, by some practitioners, is directed to keep regular watch, for a few nights after delivery. Except in cases of extreme debility, threatened uterine hæmorrhage, or acute disease, such a precaution seems unnecessary, and is more likely to injure than benefit the patient, by disturbing her rest.

The foregoing observations apply to females in all ranks of society; but it is well known, that in the humbler spheres of life, they are sometimes unable, and too often little inclined, to follow the directions of the practitioner; while it must be confessed, that a great majority of them, from their being innured to exertion, possessing greater vigour of body, and less sensibility of the nervous system, than those of the higher ranks of society, do not require to be so carefully nursed.

Sect. I.—*Inflammation of the External parts.*

This is not so often met with as might be expected, considering how much the organs are exposed to what might be viewed as causes. It is recognised by tenderness, tension, throbbing, and pain; which last is increased on examination, or on the labia coming in contact with the bed-clothes. Voiding the urine, from its flowing over parts in a state of excitement, is productive of excessive pain. The circulation is not affected at the commencement, except when the injury is extensive. In a primary confinement, the long continued pressure of the head may be a cause, but more frequently premature exposure to cold; and it may also be referred to frequent examination, and the incautious or long continued use of instruments.

When detected early, it need excite little apprehension; but sometimes it is so extensive and serious, as to occasion much anxiety. In slight cases, all we require is to keep the bowels free by the Domestic Enema or Castor Oil, to apply a warm emollient cataplasm to the part affected, and to interdict all stimuli. When there is constitutional derangement, as headache with excitement of the skin and pulse, blood-letting, local or general, according to the urgency of the symptoms and habit of the patient, must be premised. Should sloughing take place, a catheter, with a bladder appended to its extremity, is to be introduced into the urethra, and an oiled tent into the vagina. The fermenting poultice, one of decayed fruit, of carrot, or of charcoal, is to be applied to accelerate the separation of the diseased from the sound structures. In this stage, particular attention should be paid to cleanliness, while a more generous diet ought to be allowed. Finally, as a portion of the vagina is apt to become contracted, this should be remembered in the next confinement.

Sect. II.—*Sanguineous Effusion into the Labium.*

This is sometimes met with after parturition. The cause must operate during labour, though the injury is rarely noticed for a little time afterwards, from the progressive manner in which it is developed. The patient has painful tension in one or both labia, with bearing-down efforts; and when the affected organ is examined, it is found more or less tumefied. I have known it attain, in two or three hours, the alarming size of a fœtal cranium. Though formidable in appearance, it is not in reality dangerous. The

source of the effusion must be the pudic vein, ruptured, possibly, by premature distension of the part. In from three to seven hours, the labium gives way on its inner surface, when a quantity of coagula are discharged, and cicatrization speedily takes place.

The treatment is simple. If there be much pain, the patient should have a powerful opiate; and if there is a feeling of syncope, the vagina should be stuffed with soft rags to make compression on the bleeding vessels. When the system is not affected by the effusion, stuffing the passage, as it must be productive of uneasiness at so early a period after parturition, need not be resorted to. In this case, fomentations are to be applied to promote sloughing; after which, scrupulous attention to cleanliness is to be inculcated. To restore the tone of the injured organ, one part of spirits and four of water, should be used for ablution.

Sect. III.—*Laceration of the Perinæum.*

This is one of the most frequent accidents in the puerperal state. In a primary labour, if the child be large, or the patient restless, we occasionally meet with a trifling injury of the frænum; at other times it is very extensive, the whole of the recto-vaginal septum being divided; and in some rare instances, of which various hypothetical explanations have been offered, a perforation takes place in the centre of the perinæum, through which the fœtus is propelled, without the rent extending either into the vagina or the rectum. It is oftener met with after primary than subsequent confinements; and in presentations of the head than in those of other regions of the body. It is not to be ascribed exclusively, to want of support to the part; it is proper to be aware, that it may happen where frequently no blame can be attached to the practitioner, as, for example, where a woman, suddenly during a pain, makes a spring from him, and thus withdraws herself from the protection afforded her by his hand; or where she makes forcible efforts during the exclusion of the head. The author has had opportunities of knowing, that want of caution while operating with forceps has led to it. And practical men will be surprised to learn, that there are a *few* of our members who consider that such an accident cannot happen without improper interference, or, as they say, without a practitioner being present; but for every man not predetermined to prefer fancy to facts, it is sufficient to state, that a laceration of the perinæum has happened where the patient was delivered without assistance.

Slight injuries are easily remedied, but when the sphincter ani is divided, the case often proves very troublesome, unless we have the willing co-operation of the patient. This must, in a great measure, be ascribed to the difficulty of preserving the part in a state of quiescence, since its action is apt to be excited by every important function of the system. There is not, however, in obstetrical practice, a more desirable object than the reparation of the breach, and more especially when the sphincter ani has been injured; since by the fæces passing off involuntarily, the sufferer will be continually surrounded by a stercoraceous odour, which must render her a loathsome object. In the first place, the accident is to be prevented by supporting the part, which is to be effected by the application of the flattened hand, a *single fold* of a soft towel being interposed. The pressure must not be exerted to a greater extent than what will convey to the patient a feeling of support; for, were it applied in a greater degree, we should be apt to produce what we are anxious to prevent, since the perinæum would be firmly squeezed betwixt two surfaces harder than itself. Some, instead of supporting this part, recommend counter-pressure to be made on the fœtal cranium until the os externum be fully dilated, or nearly so, when the risk of injury is at an end. As a further preventive, the patient, while the head is on the eve of passing, is to be directed not to exert the propelling powers forcibly. It is proper to be aware, however, that when the part has once been injured, a callosity forms, in which a breach, notwithstanding the utmost attention, is almost sure to happen in the next delivery.

When the accident has occurred, one of two plans must be pursued. In slight cases it is sufficient to secure the limbs of the sufferer by one or two turns of a bandage above the knees; to direct her to lie on either side; to preserve the bowels free by enemata; to keep the catheter constantly in the urethra, with a bladder appended to it; and to observe the most perfect quiescence. A piece of dry lint is to be placed on the breach, and it is not to be removed until this can be accomplished with facility. Even when the rent is more than an inch in extent, it will in a day or two be scarcely discernible from the perinæum contracting so greatly after delivery; and except where the sphincter ani is destroyed, a *rigid observance* of the foregoing steps will suffice. The sphincter is rarely injured, as the laceration is rather disposed to advance slantingly towards either side. In cases of long standing, in whatever manner treated, we often fail to procure the reunion of the parts; wherefore it

should be impressed on the patient, that the success depends more upon her than on the medical attendant.

When the recto-vaginal septum is divided, pins or stitches will require to be employed; and to prevent their being prematurely disengaged by ulceration, they should include a considerable portion of structure. By the introduction of one pin at the anal, and of a second at the vaginal, extremity of the breach, the inteneration of its margins, and the twisted suture, M. Noel was quite successful in the case of a woman who experienced this injury in her first confinement, but for whom no plan of relief had been tried until after her seventh delivery, when the foregoing was adopted. On the sixth day after the operation, the pin at the entrance of the vagina was removed; and on the twelfth, the one at the rectum dropped out. During the treatment, the limbs were preserved in contact; and two days previously to the last pin being disengaged, the patient was enabled to enter on her domestic duties.* It will be useless, until after the cessation of the lochia, to attempt reunion, as this would be prevented by their flow over the breach. Since the injured parts are so apt to be influenced by the action of the adjoining structures, and reunion be prevented, Dieffenbach, to obviate this, ingeniously conceived the idea of making a free incision through the integuments, on each side of, and the same length with, the wound, a suggestion very deserving of attention. In cases where the fœtus has passed through the centre of the perinæum, the same treatment is to be pursued as in the ordinary varieties, viz. strict attention to quiescence, cleanliness, and to keep the bowels free.

Sect. IV.—*Recto-vaginal Fistula.*

This is an accident of rare occurrence, and may happen in any part of the canal. It is not dangerous, and one of the principal difficulties we shall have to overcome, is to calm the mind of the patient, who, from the excreta coming through so unusual a channel, is naturally alarmed. Fœculent matter passing per vaginam establishes the diagnosis. The pressure of the fœtal head when the brim is narrow, or the rectum charged with indurated fæces, may give rise to it; as also the incautious application of forceps; and the extraction of the fœtus by the feet, before the passages are prepared. The patient should rest on either side, live abstemiously, and on liquid food, until the breach has been re-

* Duparcque, Maladies de la Matrice, p. 437.

paired: the bowels are to be kept free by the occasional use of the domestic enema, and ablution of the vagina practised, four times daily, with tepid water. These fistulæ are occasionally repaired by nature, aided by quiescence and cleanliness, even under the most aggravated circumstances.* In some of those of long standing it has been found necessary to expose the breach by a speculum, pare or cauterize its margins, and bring them together by a suture. The reparation has been assisted by the *cautious* introduction into, *without distending*, the vagina, of surgeons' lint oiled, both to afford support to the part, and prevent as much as possible the escape of the contents of the rectum into the sexual canal. This variety of fistulæ may exist separately, or in connection with that next to be considered.

Sect. V.—*Vesico-vaginal Fistula.*

This is not only more frequent, but also more formidable than the last accident. When a breach is established in the vesica urinaria, it is much oftener the result of inflammation and sloughing, than of laceration; and its seat, generally, is the neck of the organ. It may arise from the incautious application of forceps, but much more frequently from the long continued pressure of the head. After a severe labour, the presence of an artificial opening is suspected by pain, frequent inclination, but difficulty in voiding the urine. These symptoms continue for five days, when a slough separates, and the accident is manifested by a urinous stillicidium; and if the catheter be introduced into the urethra, and a portion of the instrument is felt denuded per vaginam, both the presence and situation of the injury are at once determined. By whatever cause the accident may have been produced, it is one which may have very unpleasant consequences, unless early and judicious treatment be observed. To a woman of delicate feelings, nothing can be more intolerable, since the most scrupulous attention will scarcely conceal the urinous odour, where art has failed to restore the breach.

The success will depend on the situation and extent of the injury. Those in the neck are not only more easily, but also more frequently, repaired than such as are situated in the body of the organ. When a considerable portion of the bladder has sloughed away, the case is hopeless, and a palliative plan only can be adopted, as it would be useless to add to a woman's misery by any operation.

* Davis's Obstet. Med., vol. i. p. 123. Dupareque, vol. ii. p. 328.

From the moment the artificial opening has been discovered, the patient should be confined to the recumbent posture, a catheter, with a bladder appended to its extremity, introduced into the urethra, and there retained until the stillicidium has ceased, which will generally happen in from two to three weeks. The woman must be restricted in the use of fluids, and all undue action of the bowels is to be avoided. It consists with the author's experience, that cases which, at one time were thought even hopeless, may be permanently relieved, as now directed.

Mr Gaitskill published, some years ago, a case in which the bladder and recto-vaginal septum had been torn during the reckless use of forceps, the latter completely into the rectum, and the former partially in the neck; and although no treatment whatever was adopted for 14 days thereafter, the injury in the neck of the bladder was entirely repaired at the end of three months, merely by the permanent retention of an elastic gum catheter.* In a second instance, in which, during the use of forceps, the bladder had been injured, the breach was repaired by the same treatment, though for five weeks after the accident no step had been adopted for benefiting the patient.† In a woman who had been placed under my care, nearly two years after delivery of twins in the country, from whom the first fœtus had been extracted by forceps, and the second by the crotchet, I found the neck of the bladder open to the extent of nearly 1½ inch. I commenced by paring the breach, and thereafter closing it by introducing three stitches into its margins. At the close of 14 days two-thirds of the aperture were obliterated. Encouraged by my success, I informed the patient that it would be necessary to renew the operation, when she stated that she was five months pregnant, which induced me to desist; and as she left town shortly thereafter, I had no opportunity of repeating the operation. The instrument I employed somewhat resembled that of which Fig. 2. by Dr Churchill is a delineation.‡ Within the last few years, the breach has been obliterated by the cautery in several chronic cases under the care of individuals in this city. As indispensable to the success of this remedy, it should not be used at white heat, nor should it be reapplied until the irritation arising from its previous use has subsided. In occasional instances every plan of treatment has failed; and we are then obliged to be satisfied with ordering some contrivance to palliate the misery of the patient. My friend Dr Henry Graham of this city has suggested an

* Medical Repos. Lond. 1824.

† Med. and Surg. Journ. Edin. Jan. 1824. ‡ Diseases of Pregnancy, p. 305.

instrument for cases of incurable vesico-vaginal fistula, which is acknowledged to be superior to every thing of the kind hitherto brought under the notice of the profession.*

Sect. VI.—*Incontinence of Urine.*

This is not always the result of an artificial opening in the bladder, but of paralysis of its sphincter, which may have been injured by the long continued pressure of the fœtal head on the brim. A principal object here is to calm the mind of the patient, who is apt to view her case as one of the worst character. This condition is to be distinguished from that spoken of in the last section, by the absence of pain and strangury, and by the stillicidium having commenced soon after labour, though this process may not have been attended with much suffering; whereas, when the urine escapes in consequence of the vesica having been perforated, the individual is not sensible of the circumstance, until the fifth day after parturition. This complaint is quite transitory. A thick compress of linen or calico, immersed in acetous acid warmed, applied to the pubes, and occasionally renewed, generally affords speedy relief; ten grains of Camphor in aqueous solution, once in three hours; or fifteen drops of the Muriated Tincture of Iron, three times daily, will sometimes prove effectual.

I have known some cases resist every remedy until the patient was enabled to go into the open air, when the incontinence at once subsided.

Sect. VII.—*Retention of Urine.*

This state must be owing to one of two conditions; either spasm of the sphincter vesicæ, or impaired contractility of the muscular fibres of the bladder. Some disease of a neighbouring organ, as the rectum when the seat of piles, may lead to the first; as may also injury done to the lining membrane of the vagina, and to the neck of the bladder. Impaired contractility generally arises from over-distension, the contents of the vesica having been too long retained. When there is reason to suspect spasm as the cause of disordered function, a large dose of the Tincture of Opium and of Nitrous Æther combined, should be ordered; and a warm fomentation applied to the pubes and vulva. In about twenty minutes after the exhibition of these medicines, the patient should be directed to turn on her knees to void the

* Lancet, Nov. 13, 1841.

urine. If this cannot be accomplished after one or two trials, the catheter must be used. This operation requires to be performed with dexterity, and with due regard for the feelings and delicacy of the patient, whose parts we are not, if possible, to expose.

When the use of this instrument cannot be dispensed with, the woman requires to turn upon her back, and draw the knees towards the abdomen, separating them at the same time. The practitioner is now to slip the left hand under the bed-clothes and pass it over the thigh of the patient to the vulva, to ascertain the situation of the *meatus urinarius*, which, surrounded by a *caruncula*, is to be felt about half an inch below the *radix clitoridis*. The index of the left hand should be placed on the meatus; while by the right, carried under the thigh, the catheter, with a bladder appended to its extremity, is to be conducted into the urethra. When suppression has arisen from previous over-distension, the patient must be directed to void the urine at short intervals, to prevent accumulation, and afford the fibres of the bladder an opportunity of regaining their natural power. A catheter with a stop-cock has been invented, which effectually prevents the escape of the urine on the bed.

Sect. VIII.—*Inversion of the Uterus.*

We now rarely meet with this accident, by which state is to be understood, that the fundus is forced down through the aperture of the uterus, or that the organ is turned inside out. It may be partial or complete. When in the former state, the uterus is still retained in the passage, the fundus protruding in various degrees through its aperture, and forming a firm body not unlike the head of a child. The patient has severe bearing-down efforts, pallid countenance, feeble pulse, syncope, and difficulty in voiding urine. As from the reports of cases which have been recorded, it would appear that hæmorrhage is not always profuse, syncope and other symptoms of great prostration are to be ascribed, not to loss of blood, but to the shock communicated to the nervous system, and to the tension of the cerebral vessels being removed by the evacuation of the uterine contents, and the sudden displacement of the organ.

When the inversion is complete, a fleshy protrusion is discovered at, or exterior to, the *os externum*, and no uterine tumour is to be felt above the pubes in the abdominal cavity. In these cases, the vagina is reduced to the same state; and the external is now what was formerly the

internal surface of the misplaced organs. The hæmorrhage is trifling.

It was usual to ascribe the accident to mismanagement in the removal of the placenta; and its rare occurrence in the present day, that this duty is now better understood, and practitioners of undoubted experience having been called to assist in cases where no doubt could be entertained that inversion had been caused by undue traction upon the funis, we cannot therefore hesitate to acquiesce in the former opinion, though it is obvious, from the illustrations published by Dr Radford, in his valuable communication,* that the alleged cause is not the only one. Several cases are related by this eminent practitioner where there was neither premature nor undue traction used upon the funis, but where some other variety of, though not cognizable, irritation acting upon the same principle, however, by exciting irregular uterine action, had led to the accident. Among the causes by which irregular contractions may be excited, the abrupt extraction or propulsion of the shoulders and body of the fœtus, and premature rupture of the membranes, may be enumerated. Displacement has happened, however, in some instances, spontaneously, and the uterus seemed to be impelled per vaginam with great force and rapidity.

These cases may prove suddenly fatal, from flooding, and the other causes stated; or they may do so, though in a protracted manner, from excessive and long-continued hæmorrhagic and leucorrhœal discharges. When the reposition of the uterus cannot be effected, the prognosis must be guarded. It is proper to be aware, however, that when early and judicious measures have been adopted, the event is generally successful. Much discrepancy of opinion exists as to the latest period at which the reposition of the uterus can be effected. Dr Denman has failed, when four hours only had elapsed before visiting the patient; while in some of Dr Radford's cases, the uterus had been restored to its proper position, seven or eight days even, after the displacement.

In the management, an attempt must be made, by *persevering* but *cautious* efforts, to accomplish reposition as speedily as possible after the accident. We have to consider previously, however, whether the placenta, when still adherent, should, as a preliminary step, be detached or not? The best authorities entertain different views on this point; for while Drs Merriman and Radford are in favour of detach-

* Practical Essays on various subjects connected with midwifery.

ment, and the latter enforces his opinion by satisfactory illustrations, Professor Burns and Dr Ramsbotham are opposed to the practice. The author cannot, from his own experience, decide which principle should be acted on; and although it might be thought that hæmorrhage would be increased by the separation of the mass, yet as this was not the result in Dr Radford's cases, and as he so confidently advocates detachment previously to attempting reposition of the uterus, we are warranted in adopting the practice. The uterus must be grasped, firmly compressed in the hand, not pushed with the points of the fingers, and urged upwards and backwards in the axis of the outlet, with a view to undo the inversion. By compressing the organ, contraction and diminution of its volume will follow, whereby our object will be more easily attained. The practitioner must not, till after repeated trials, despair of success. In some of the cases it would appear, from the manner in which reduction is spoken of, that this is easily accomplished. Where the displacement is but partial, urging the protrusion upwards with the back of the fingers,—the hand not being completely closed,—will suffice. If reposition has been effected, the hand must be retained in the uterus until its contraction is complete.

When reduction cannot be accomplished, and the irritation arising from pregnancy has subsided, the organ is to be encircled by a ligature, which is to be very progressively rendered tighter, every alternate day, until it has dropped off. A firm waxed thread, of the thickness of cat-gut, will answer perfectly, and it may be applied by the fingers; but the double canula, when required, must be both longer and of larger calibre, than the instrument usually employed for polypi; and should much irritation arise after inclusion, the ligature must be temporarily slackened or removed. While we are conducting the separation, ablution of the parts with tepid water, will be necessary morning and evening; and the fluid had better be injected either by a syringe, or a common injection-bag. Headache, or any other symptom indicative of plethora, arising from the suppression of the catamenia, is to be relieved by laxatives and topical blood-letting, while the patient is to be restricted to spare diet and the limited use of fluids. The periodical secretion has been known to return after the removal of nearly the whole of the uterus. From what happened in Dr Radford's third case, there is reason to believe that nature, in some instances, upon the same principle as has been known to happen in polypi, has detached the inverted part of the uterus. Under the present

circumstances, the organ has also been successfully removed by the knife.

Sect. IX.—*Separation of the Pelvic Bones.*

Notwithstanding the care which nature has bestowed in uniting these bones, a separation of them is sometimes observed, either at the pubes or at the sacro-iliac symphysis. This may happen in the latter months of pregnancy, during parturition, or we only detect it in the puerperal state. This disunion is sometimes extensive, at other times trifling. The author is disposed to believe, that on the approach of, or during parturition, the *media*, by which the bones are united, yield in a small degree. In some of the lower animals, as the seal, for example, the separation is considerable. The solution is never so extensive, except when the result of violent injury, as to facilitate the transit of the fœtus when the pelvis is much confined; though, when it is but slightly affected, there is no question that the extent to which the structure that unites the bones would yield, under ordinary circumstances, might be the means of preserving the child, and in some degree diminishing the sufferings of the parent. The ancients carried this notion to a greater extent than experience has justified; while some of our brethren of our own times, not indeed practitioners of midwifery, deny that there is any separation.

There is a greater disposition to this affection at the time of gestation than at any other period, probably from the current of blood towards the pelvis being increased, whereby a greater proportion of interstitial fluid, betwixt its bones, is effused; and a liability to disunion established, by causing mollescence of the connecting ligaments. The accident is hurried on by the continual pressure, and distending influence of the gravid uterus, both during gestation and parturition; by the antagonizing action of the muscles concerned in that function, and the relaxation which supervenes to it. Falls and blows have produced the dissolution of the pelvic symphyses.

The symptoms are indicative of much local and constitutional disturbance, as frequency of pulse, excessive pain in one or other of the pelvic junctions, aggravated on pressure, or on moving the body or lower limbs. When the sacral extremities are moved, a sensation is communicated to the patient from some point of the pelvis, as if two surfaces were rubbing against each other; and if there be disunion at the pubes,

the same feeling will be perceived by any one else, when a finger is applied near the part affected. There is pain and difficulty in voiding urine, and the sympathetic fever runs high. In most instances the patient recovers, but the convalescence is protracted. When the separation is the result of accident, such cases prove formidable from the violence of the inflammatory action, and constitutional disturbance. Inflammation and abscess are frequent attendants when this state is unconnected with accidental violence; and when these are its terminations, the prognosis requires to be very guarded. Suppuration is generally followed by hectic and death. In other instances the patient is reduced to a deplorable condition, by exfoliation of the bones of the pubes, with permanent lameness.

In treating these cases, absolute rest should be enjoined from the first. The patient should be directed to lie as much as possible upon her back, with the knees drawn up and supported; and something like the ordinary binder should be applied round the pelvis, with such a degree of firmness as shall convey a feeling of support, and prevent further separation. To ensure rest, the urine is to be removed by the catheter; and in attending to the bowels, enemata are to be used as occasion may require; while, in evacuating the rectum, the patient must be treated as a person incapable of rising. Pain, in any of the pelvic joints, is to be allayed by the free use of leeches or cupping; and if the practitioner is not satisfied with the measure of relief obtained, or if there be much sympathetic fever, general blood-letting must be conjoined, in proportion to the powers of the system. A powerful dose of the Sol. Mur. Morph. should be administered after these operations, as also every night at bed-time. The diet must be strictly antiphlogistic. Nursing should be abandoned from the first.

When convalescence is established, a country residence and sea-bathing should be recommended; the salt water to be used at first in a tepid state, and gradually reduced to its natural temperature. As gestation renews the disposition to this complaint, the party should be cautioned against being in this state until the general health is restored. When the individual has conceived, she should submit monthly, about the time the catamenia should have appeared, to the subtraction of three or four ounces of blood from the arm; or six leeches may be applied to either groin with equal advantage. Moderate exercise in the open air should be frequently indulged in, and constipation sedulously avoided.

Sect. X.—*Separation of the Coccyx.*

This bone may be separated from the sacrum either from falls,—the patient having come to the ground in a sedentary position, or it may be disunited by the pressure of the fœtal head during parturition. Dr Denman relates a case in which the disunion was attended by a distinct noise; and Dr Ramsbotham also notices three instances in which he was concerned, but without stating that the accident was accompanied by any unusual sound. The separation may be recognised by the bone being felt to have given way under the hand, perhaps during the application of forceps, or at the moment of a forcible uterine contraction, and being at the same moment attended by an unusual sound. In several instances where those accidents ensued, I could afterwards feel the bone floating loosely among the softer structures. Its separation during labour is not by any means attended by the same degree of suffering which accompanies the accident when it results from falls. Such cases are to be treated by the patient observing absolute corporeal quiescence, lying constantly on either side, and avoiding constipation.

Sect. XI.—*Paralysis of the Pelvic Extremities.*

This may either be partial or complete; and in all the cases which I have seen, confined to one of the limbs. It must be owing to the long detention of the head in the pelvis from disproportion, and consequent injury to the pyriformes muscles, or great sacro-schiatic nerves. The partial variety is what we generally meet with; and in either it is a protracted complaint, without the patient, however, in any instance that I have seen, becoming permanently lame. It should be treated by the application, in the first instance, of a sufficient number of leeches, or the cupping machine, over the *foramen magnum ischiaticum*, and fomentations during the presence of uneasiness. In protracted cases I have employed embrocations and sinapisms with decided advantage.

Sect. XII.—*Emphysema.*

This is a complaint of rare occurrence. Sometimes the diffusion of air is partial, being confined to the neck and chest, where it commences: on other occasions it extends over the whole body, even to the toes. It is not observed until after parturition, when it makes rapid progress, and occasionally assumes an alarming appearance, the trunk swell-

ing to nearly double its natural size; and when the hand is moved along the surface, a sound is produced, similar to that occasioned by handling a dried bladder partially inflated. The respiratory function, though disordered, is not so much so as might be expected from the state of general tumefaction; the patient complains more of oppression than of actual breathlessness or dyspnœa. The immediate cause is the same as in cases unconnected with the puerperal state. It has been noticed, either in females who have been obstinately silent during labour, or the very reverse. In the former case, the pulmonary cells may be ruptured from the long retention of the air; or in the latter, they may be burst from inordinate and violent action.

Though apparently formidable, this is in reality a mild affection. In three cases which fell under the notice of the author, the swelling ceased entirely by the eighth day, almost without any medical treatment. If there be much pain in the chest, with dyspnœa, blood should be abstracted from the general system, in proportion to the vigour of the patient; but as this is a remedy usually resorted to in difficult labours, it is seldom required afterwards. In the cases encountered by the author, venesection was only practised during parturition; and the patient had two doses of a saline aperient. If the symptoms were urgent, it might be necessary to make punctures with a lancet at different points over the chest, to permit the diffused air to escape.

Sect. XIII.—*After-pains.*

Except those who are for the first time in child-bed, no woman escapes being more or less troubled with these complaints; they are so styled, from their coming on after parturition; they are merely the contractions of the uterus, and continue to recur until this organ be reduced to a certain size. The formation of clots excites them, as also the retention of a portion of the membranes, in some instances, to a violent degree. When induced by these latter causes, some writers have termed this state of suffering, a cramp of the uterus. The author cannot conceive any just grounds for this distinction; on the contrary, he thinks it may prove hurtful, by leading to the exhibition of medicines possessing the power of allaying spasmodic action, but which in this instance are useless, if not hurtful. After-pains continue to recur in paroxysms, from three to five days; they are more troublesome in females who have had a numerous family, and in those among the higher spheres of life, than patients

in the opposite circumstances. If the nipples be tender, the pains are severely excited when the infant is applied to the breasts, from the powerful sympathy betwixt these organs and the uterus.

The novice must endeavour to distinguish betwixt this uneasiness, and some affections which resemble it, as colic, and inflammation of the uterus, or of the peritonæum, to prevent the patient being unnecessarily reduced by blood-letting. From colic, it may be known by the seat of pain being different, and by blood or lochia being passed *per vaginam*, during every paroxysm of uneasiness. It may be distinguished from peritonitis and hysteritis, by the circumscribed state of the pain, its returning by paroxysms, and by the total absence of vascular excitement.

The sufferings of the patient can be speedily palliated, but some discrimination is required in the choice of remedies. It would be injudicious to order any medicine to allay after-pains, which, in an individual who had suffered severely during parturition, might tend to produce further relaxation of the uterus, and thus favour preternatural effusions. If the woman be vigorous, and have suffered little during labour, she should be ordered, the first night subsequent to her delivery, fifty drops of the Tinct. Opii, and thirty more in an hour afterwards, if the former quantity have not afforded relief. Due attention to the state of the bowels also, conduces to the more speedy removal of after-pains. In a woman of relaxed habit, or who has had a protracted labour, Camphor, in doses of ten grains every second or third hour, will be found the most judicious remedy. The binder should be drawn firmer daily, during the recurrence of the uneasiness.

Sect. XIV.—*Rigors.*

These are occasionally observed to an incredible extent after primary labours; at other times they are so trivial as to pass almost unobserved. When very severe, they are apt to cause much alarm, not merely to the attendants, but also to the novice in practice; but they are not in reality dangerous. Shiverings may be considered as the result of that collapse which succeeds every violent effort, or long-continued excitement; and it is not improbable, that the change which takes place in the circulating mass, after the expulsion of the fœtus, conduces to them. When they are so severe as to command attention, the binder must be applied with greater firmness round the abdomen, a dose of Sp. Aromat., Æth. Sulph., brandy, or any cordial that is at hand,

should be administered; and heated irons, or bottles containing hot water, are to be applied to different points of the body.

Sect. XV.—*Syncope.*

This sometimes takes place after a severe labour, and generally when the patient assumes the erect posture, or turns on her knees to void urine. Though alarming in appearance, the author never witnessed a fatal example. The change which takes place in the circulation, and the languor that supervenes after the cessation of every severe excitement, must conduce to fainting. As the attendants become alarmed from an idea that it is the result of hæmorrhage, and as a young practitioner is apt to be unhinged by their clamour, he should remember the phenomena, which, besides effusion of blood, distinguish fainting produced by this more alarming state. In syncope, arising from an ordinary cause, the pulsation at the wrist becomes at first slow, and then gradually ceases altogether; but when it arises from uterine effusion, the circulation, though small and rapid, continues distinct.

Although, generally speaking, fainting is not followed by any unpleasant consequences, yet some fatal examples have been related; and the appearances on dissection have not been sufficient to account for the event. When syncope supervenes, the attendants are sometimes so panic-struck, as to be incapable of assisting the patient, who, probably, becomes irrecoverable from neglect. The room should immediately be freely ventilated, the head placed lower than the trunk, the abdomen firmly compressed, heat applied to different parts of the body, and cordials exhibited internally. Small doses of ammonia, æther, or camphor, are proper; and the individual must be cautioned against being too early in the erect posture.

Sect. XVI.—*Lochia.*

The uterus after parturition, furnishes a discharge so styled, which continues for various periods. At the commencement it is sanguineous, in a few days it becomes of a dark greenish aspect, and ultimately it assumes a pale mucuous appearance. The time required for effecting these different changes, varies in the different ranks, and even in the same female, from twelve to sixteen days; and previous to its final cessation, it resembles leucorrhœa. When it be-

comes greenish, it possesses an odour so intolerably fœtid, as to induce those who are not aware of this, to consider the condition of the patient as arising from personal neglect, or as the precursor of some morbid change. The quantity also varies. In persons of vigorous habit, for the first time in child-bed, its duration and proportion are less than in those who have had a numerous family, and are relaxed. It is more profuse in nurses than in individuals who do not undertake this duty. In healthy females among the humbler classes, it seldom continues longer than three weeks; in those of the better ranks, from four to six,—a difference to be ascribed to the more speedy reduction of the womb in the former than in the latter. The most scrupulous attention to cleanliness must be observed during its continuance. It should be discouraged after the tenth day; *first*, by ablutions with tepid water, three or four times daily; and, *secondly*, after the end of the week, by cold water used equally often.

Premature suppression of the lochia, unless early noticed, may be followed by hysteritis, and subsequently by peritonitis. Such a state may arise from exposure to cold, but particularly the premature use of stimuli. When the discharge ceases too early, the patient has pains in the hypogastric region, darting towards the ovaria; an excited and painful tension of the abdomen. The first warning which the patient has, probably is abdominal uneasiness when the nurse is adjusting the binder, which it is observed cannot be applied as firmly as before, without occasioning great pain. These symptoms are soon followed by disturbance in the circulation, the pulse in three or four hours increasing from 70 to 140 in a minute. Our chief object is to restore the discharge,—to effect which, injections of warm water are to be thrown into the vagina, once in four hours; warm fomentations to be applied to the external parts, and a sufficient quantity of some brisk cathartic to be given by the mouth. Enemeta will be found useful. But if the sufferer is not speedily relieved by these remedies, general blood-letting must be resorted to, or a number of leeches applied to the groins and vulva.

Protracted flow, is another condition of the lochia, which, though sometimes difficult of removal, is not liable, however, to be followed by results so unpleasant as the preceding. This state is most frequently met with among individuals who have had a numerous family, persons of a strumous habit, those who are martyrs to the mental passions, such as indulge in stimuli and warm drinks; and those pre-

maturely assuming the erect posture, or taking exercise with the sacral limbs.

In commencing the removal of this condition, we are first to ascertain the cause, and caution the woman against it. We recommend her to keep at a distance from fires, to inhabit a well ventilated apartment, to use but few bed-clothes, to indulge in a dry, solid diet, and to be often in the open air. Ablution with cold water must be frequently practised. Obstinate cases are sometimes met with, which only yield to plunge or shower baths, and astringent injections *per vaginam*, such as decoction of oak bark, or of galls, the internal exhibition of tonics, and regular doses of ergot.

Sect. XVII.—*Milk Fever.*

By this affection is to be understood, a smart symptomatic fever, of the synochial type, which by a few hours precedes the mammary secretion. In primary confinements, and especially in plethoric females, it is pretty severe; but after subsequent deliveries it is not very obvious. On the second or third day after parturition, it commences with chills, languor, followed by headache, burning heat of skin, vascular excitement, and considerable tension of the breasts. The cerebral derangement, in those who are liable to headaches, during the menstrual period, is incredibly severe, sometimes amounting to delirium, which has occasionally led to the present complaint being confounded with typhus, causing such alarm to the attendants. But the circumstances of the breasts continuing tense, must distinguish this from every formidable febrile affection in the puerperal state, in all of which, these organs become soon flaccid, though previously well distended. Uterine hæmorrhage mitigates, or completely prevents milk fever. The patient requires to be restricted in fluids, and in nourishment; and to be ordered a full dose of some saline cathartic. When the headache is troublesome, the application of some leeches to the temples, will prove beneficial. The author never found it necessary to order bleeding in any form.

Sect. XVIII.—*Ephemera, or Weed.*

This is one of the most frequent complaints in child-bed. It consists in a febrile affection of twenty-four hours' duration; and, except in mismanaged cases, the author never met with an instance where it continued longer. When the sweating stage is prematurely suspended, another attack of

the complaint immediately follows, which, by those who are not aware of this circumstance, is considered as the original one still going on, and which has led some to suppose, that, occasionally, ephemera continues for a longer period than twenty-four hours. It is most generally observed during the first fortnight; and though some writers think that it is not met with after the cessation of the lochia, yet the author is certain, that distinct cases of it are to be encountered at a much later period after delivery. Ephemera is oftener a complaint of the higher orders, than of females in the humbler spheres of life; of debilitated nervous individuals in all ranks, than those of opposite habits; of the winter than summer months.

On or before the approach of the disease, the patient is observed to yawn and stretch herself greatly, and to appear very languid. To this succeeds a sensation of cold, first between the shoulders, and thereafter along the spine; and at last it becomes general over the whole body, attended with pain in the head and large joints. Sometimes a sense of soreness is felt in the region of the uterus, and if the lochial discharge be present, both it and the milk are diminished in quantity. The attack is sometimes preceded by palpitations, or the patient suddenly awakes from sleep after some frightful dream, and rigors quickly succeed. To a practitioner of experience, this train of symptoms gives warning of the true nature of the case. This cold stage, which is sometimes equally intense with that of intermittent fever, is various in its duration; it seldom continues, however, longer than an hour. To this shivering fit succeeds one of great heat, which in duration and severity is much more harassing, than that which preceded it; the skin is excessively parched, the headache excruciating, sometimes there is delirium, deep-seated pain in the orbits, rapid and irregular pulse, great thirst. In a little time, these symptoms are succeeded by profuse sweats, which if allowed to continue sufficiently long, relieve all uneasy feelings.

Whatever tends to debilitate the patient, or to render the nervous system more susceptible, may be considered as affording a predisposition to it; hence pregnancy itself may be viewed as a powerful predisposing state. Exposure to cold, fatigue, night watching, and all the mental passions, are exciting causes of daily observation. The suddenness of the attack, the great irregularity of the pulse, the absence of all local pain except that of the head, the intensity and irregularity of succession of the different stages, will distinguish this from every other puerperal affection. Though the author

has never seen a fatal case, yet the disease has some troublesome sequelæ, as mammary abscesses, suppression of the milk, and feebleness of body and mind. Two or three attacks are almost certain of being succeeded by suppression of the milk, or mammary abscess; and even one weed, unless the greatest caution be observed, is equally sure of being followed by a second. The mental debility is so great, the patient continually declaring her conviction that she is dying, that the attendants, and even young practitioners, are much alarmed.

In the treatment we have two indications in view; *first*, To conduct the disease regularly through its stages; and, *secondly*, To restore the tone of the system. If a practitioner be on the spot before it is formed, and remembers the precursors of the malady, it may be easily arrested, by administering a dose of the Sol. Mur. Morph., Tinct. Op., Sp. Aromat. Camphor, Æth. Sulph., or Tinct. Valer. Vol. When, on the other hand, the cold stage is formed, means are to be resorted to for diminishing its violence and shortening its duration, whereby we usher in the hot stage. With this view the patient must be allowed plenty of bed-clothes, mild warm diluents, and bottles containing hot water are to be placed at different points round the body. When the hot stage commences, perspiration must be encouraged; wherefore, two grains Submur. Hyd. and three Pulv. Antimon. are to be administered every third hour, and the diluents continued, till moisture be perceptible on the surface. The object in view is sure to be attained by a second dose of these medicines. Perspiration must be supported until the head is completely relieved, and the pulse reduced to its natural standard, which generally requires five or six hours. When these symptoms have been subdued, perspiration is to be discouraged, by gradually diminishing the load of bed-clothes, and ordering saline juleps. An ounce of a solution of two drachms of Carb. Ammon. in six ounces of water, saturated with citric acid, given every hour, will be found very eligible, from the influence of the Ammonia in allaying nervous irritability. This medicine will be best relished when it possesses an excess of acid.

By restoring the tone of the system, which is our second indication, we diminish the susceptibility to impression, and prevent a recurrence of the disease. In the *first* place, all the exciting causes are to be avoided, and more especially the mental passions; *secondly*, for several days after it has been subdued, camphor, in doses of five grains, should be ordered four or five times daily, to allay nervous irritability; *thirdly*, if the patient be in circumstances, and has had more than

one attack, nursing ought to be relinquished. The diet should be dry, easy of digestion, and of a generous nature. Some tonic medicine must be administered, the patient ought to be frequently in the open air, and the bowels are to be regulated by some mild laxative.

Sect. XIX.—*Miliary Fever or Eruption.*

This is rather a sequela of the subject last considered. It consists in small pimples, about the size of millet seeds, which are inflamed round their base. They are ushered in by languor, chilliness, nausea, and oppression at the præcordium. These phenomena are succeeded by other slight indications of general derangement, acceleration of the pulse, and some little increase of the natural temperature. Previous to the development of the eruption, the whole surface, but more especially the trunk of the body, is pervaded by a sense of pricking, followed quickly by excessive itching; and the skin feels rough, exhibiting the appearance termed *cutis anserina*. The upper part of the tongue is loaded, its margins and raphe red, while the fauces are sometimes aphthous. Febrile excitement does not continue above one or two days, during which the lochia and secretion of milk are slightly checked. The pimples appear first on the forehead, and thence rapidly extend over the neck, breast, and trunk. In two or three days they desquamate, and are sometimes succeeded by another crop. Some authors have divided the rash into two varieties, the white and red, a distinction little required, when the benign nature of the disease is considered. It is proper to distinguish it from psora, however, with which, from its excessive itching, it is apt to be confounded; but this latter invariably commences between the fingers, and never shows itself on the face, nor even on the neck, except in cases of long standing.

General relaxation predisposes to miliary fever, hence the reason why it is a frequent sequela of weed. Impure overheated air, stimuli and rich food, neglecting the bowels and personal cleanliness, are frequent exciting causes. Red-haired females have been alleged to be more subject to this eruption, than individuals whose hair is of a different colour; but it seems difficult, if not impossible, to conceive the grounds of this notion. When the directions of the practitioner are strictly observed, the removal of this complaint is easy. In the *first* place, we order the ablution of the body every morning with tepid water; *secondly*, we direct the bowels to be regulated by means of Pulv. Jalap. Comp., or

Carb. Magnes., and Pulv. Rhei; *thirdly*, some tonic must be prescribed, as Acid. Sulph. Dilut., or the Sulph. Quin.; and, *fourthly*, the apartment to which the patient is confined requires to be freely ventilated, and a load of bed-clothes avoided. When an individual has had successive crops of the eruption, nothing but the rigid observance of these rules will avail.

Sect. XX.—*Phrenitis.*

This is a most formidable malady, but fortunately it is of rare occurrence. It should excite the utmost solicitude of the medical attendant; for, though the line of practice to be pursued is clear, yet it is to be regretted that few patients recover. The disease may show itself at all seasons, but chiefly during the warm months; it may attack females of every variety of character, but such as are plethoric, and individuals of acute feelings, are chiefly its victims; hence, it is oftener a disease of women in affluent circumstances than of those in the humbler spheres of life. It rarely begins before the third day after delivery; and it is very insidious in the onset, which should induce the practitioner to be regular in his attendance, and to make diligent inquiry regarding the state of his patient at each visit. In this, as in other formidable diseases of excitement in the puerperal state, the pulse continues frequent after delivery; or, if it subside, it soon afterwards becomes accelerated. If the heart's action be not reduced to its natural rate by the end of twenty-four hours after delivery, the individual should be closely watched; for such a state may be considered a certain precursor of some dangerous malady.

The individual soon complains of severe headache and unusual throbbing within the cranium; the face is flushed, the countenance presents an unsettled aspect, there is fearful rolling of the eyes, intolerance of light and noise, hurried and incessant talking, indisposition to sleep. The foregoing symptoms are almost constant attendants, but as the disease advances, the pain of the head extends along the occiput and spine; the patient has frightful dreams; memory becomes impaired; the countenance wild; the eyes are in perpetual motion, and turgid; the temporal arteries throb strongly; and there is furious delirium. From being full, the pulse becomes small, hard, and always quick; the thirst is urgent; tongue dry and furred; bowels torpid; and urine suppressed. As in other severe diseases in child-bed, so in this, the lochia are partially, and the milk completely suppressed.

Pregnancy, from the irritability of the nervous system induced by it, as well as the plethora which results after delivery, may be considered the chief *predisposing cause.* Under the head of *exciting causes*, all the mental passions may be included, but more especially those of the elevating kind; and also the premature use of stimuli, whether food or cordials. By a careful observation of the symptoms, this affection may be easily distinguished from mania, the only one with which it is apt to be confounded. In phrenitis, there is always severe headache, high temperature, great disturbance in the vascular system, with total loss of appetite, all of which invariably precede the mental aberration: In mania, on the other hand, the head is seldom complained of, and there is neither vascular excitement nor heat of skin; and, generally speaking, the appetite is better than in a state of health. Moreover, in phrenitis the delirium comes on with little warning; while, in mania, its accession is gradual.

All cases of phrenitis require a *most guarded prognosis*, for, as already observed, few recover in the puerperal state. The fatal event generally happens betwixt the fifth and seventh day. Violent delirium, deafness, and suppression of urine, are untoward symptoms. A reduction of the frequency of the pulse, and of the temperature, moisture on the skin, a copious flow of urine, the patient remembering her dreams, and replying in a more composed manner to questions asked her, are to be viewed in a more favourable manner. When the disease continues longer than a week, the consequences are generally distressing, for the result is permanent idiocy or mania; or the patient continues comatose or insensible for a few days, and is suddenly carried off by convulsions. *Autopsies* exhibit a thickening of the membranes of the brain, sometimes sphacelus of them; an effusion of coagulated lymph on the surface of the organ; at other times suppuration of its substance, mollescence of it, or a collection of serum in its cavities; and when it is sliced, a much greater number of bleeding points are observed than in a state of health.

In regard to the treatment, nothing but early and vigorous measures can save the patient; there is no disease in which pusillanimous conduct can be more dangerous. Phrenitis has been much more fatal in the puerperal than in any other state, a result which may be presumed to have arisen from injudicious practice, founded on the opinion, that females in child-bed cannot support venesection so well as under other circumstances, whence this remedy has not, in such cases,

been employed with sufficient boldness. When the disease is met with in the other sex under the torrid zone, in consequence of insolation, the result is diametrically opposite, for they are largely bled from the first. The chief object of the practitioner in this malady is to subdue excitement both local and general. Whenever we are informed that the patient is sleepless, and talks a great deal more than usual, measures should be concerted for her safety. With this view, the apartment ought to be obscured, strict quiet observed throughout the dwelling, a sufficient quantity of some powerful cathartic ordered, and, after its operation, a full dose of Sol. Mur. Morph. Should symptoms more corroborative of our suspicions be evolved in despite of these precautions, the most active steps must immediately be pursued. In a word, the individual must be bled in a decisive manner, both generally and locally. Venesection is to be performed in the recumbent posture, and blood allowed to flow till the pulse begins to flutter; after blood-letting the morphine solution should be repeated, the patient watched, and the vein re-opened, as the urgency of the symptoms, or the measure of relief obtained, shall dictate. If, after a reasonable period, we are not satisfied with the impression made on the disease by the foregoing remedies, blood must be abstracted from the back of the neck by cupping, the head shaved and left exposed, or covered with a succession of thin compresses immersed in cold water. Where depletion has failed to subdue the excitement, Digitalis in powder, in doses of two grains every alternate hour, Tart. Antim. to produce deep nausea, or a tobacco enema, thrown into the rectum, have all been recommended.

Blistering the whole head, as a counter-irritant, has been extolled. It has also been supposed, that these applications would encourage the blood from the interior towards the surface; but it should be remembered, that the communication betwixt the interior and exterior of the cranium is not free, since all the vessels which emerge from its cavity, with the exception of the ocular arteries, are mere twigs. Covering the whole upper part of the cranium with a blister is more likely to increase than diminish the irritation within; hence, the author, except in cases of coma, prefers applying a blister in such a manner as to extend from the arches of the occipital bone to near the middle of the scapulæ, when he is desirous of acting on the brain. It is scarcely necessary to observe, that the strictest antiphlogistic measures must be pursued throughout the treatment.

Sect. XXI.—*Puerperal Fever.*

Without entering on the literary history, of which there is an ample detail in the author's work on the subject, it may be sufficient to state, that the disease is described in the earliest records of our profession, and that there is none which has been more attentively investigated by pathologists of every country. It may almost be said to be endemial to those quarters in which the atmosphere is cold and moist, and the vicissitudes of weather remarkable; for the disease rarely occurs in warmer and more settled climates. During an epidemic season it is most impartial in its attacks; it is not peculiar to any constitution or temperament, but seizes promiscuously females of every description and character; for the rich and the poor, the young as well as the old, the delicate as well as the robust, the married as well as the single, those who had premature labours, as well as those who were delivered at the full time, those who have had easy, as well as those who had difficult or instrumental labours, have suffered from it. It is more frequent and fatal among females delivered in hospitals, than those attended at their own houses. At La Maternité, in 1828–29–30, about a fifth part of those delivered were seized with it. Many writers have remarked that its visits have often been contemporary with those of erysipelas; but the author has met with only one instance in which both diseases were co-existent. By every man whose opportunities have been considerable, it has been observed to be most uniform in its period and mode of attack, and in its leading symptoms. Occasionally it commences before delivery, though generally not for two or three days after this event; in some instances it begins in less than twenty-four hours thereafter; and in others not for several weeks.

As in other diseases, so also in this, the symptoms are modified by the structures involved; and hence the somewhat numerous varieties that writers have endeavoured, but fruitlessly however, to describe. While I confess that my own description, when I wrote on the subject, more than 20 years ago, was too general and indefinite, I do not hesitate to state, now that my conceptions have been matured by reflection and observation, that I am far from assenting to the supposition that the profession are to be benefited by the overstrained acuteness of observation, and ingenuity for generalizing, displayed by some of our brethren. I entirely coincide with Dr Churchill in the propriety of making the local affection the basis of our arrangement; but I cannot see

the advantage which is to accrue, either to the student or the practitioner, by describing fourteen varieties* of the disease, since the difference betwixt several of them consists, at most, in mere shades; since the train of symptoms developed in consequence of the morbid action involving the peritonæum scarcely differs from that which arises when the uterine covering, or that of the uterine appendages, is similarly affected; and since the phenomena resulting from inflammation of the deeper structures of the uterus, of its veins, of its absorbents, and of the variety complicated with erysipelas, can with difficulty, if at all, be distinguished from each other. And again, can it be denied that the disease will require to be similarly treated, whether it is dependent on inflammation of the peritonæum generally, that portion of it only which covers the uterus, or that which envelopes its appendages? It is equally certain that the varieties arising from the same morbid state of the other structures, and that complicated with erysipelas, must all be subdued nearly by the same means; but differently, as will hereafter be seen, from those which arise in consequence of the lining membrane of the abdomen being involved. Dr Churchill, whose industry in the department of midwifery is beyond all praise, although he has chosen to divide the subject into five varieties, nevertheless acknowledges that it is not always possible to separate these affections, and that they present similar symptoms. For the foregoing reasons, I shall follow the example of Dr Gooch, by describing only *two varieties* of the disease, viz. the inflammatory and typhoid, while such symptoms as are inconstant in their appearance, for example, hepatic, gastric, pectoral, and cerebral derangements, with erysipelas, will be particularized under these heads as complications.

Peritonitis.—This is the form under which sporadic cases, more especially in private practice, appear; the first symptom usually noticed is a rigor or a succession of shivering; and as the author has not known this phenomenon to be wanting oftener than once in forty or fifty cases, a patient who complains of it during an epidemic season ought to be carefully watched. Though, in most instances, the shivering is sufficiently well marked to command attention, yet, at other times, it is far from being obvious; so that occasionally the

* Simple peritonitis, erysipelatous peritonitis, puerperal fever from inflammation of the uterine appendages, of the uterus, of its veins, of its absorbents, of its muscular structure, the congestive variety of Armstrong, besides the bilious, pituitous, and sporadic, with Ferguson's gastro-enteric, nervous, and complicated.

invasion of the disease is insidious. To this succeeds a headache; the pain being either in the forehead, deeply seated in the orbits, or very troublesome in the occiput: sometimes it is an antecedent, at other times a sequence, to the cold fit, but whether it precedes or follows it, the patient describes it as distressing. The cold is succeeded by increased heat, which is confined to the trunk of the body, and it is not so intense at any time as might be expected, considering the severity and inflammatory nature of the disease. It is necessary to caution those whose experience has been limited, against being misled by this temperate state of the body.

The next symptom, which rarely fails to command early attention, is the abdominal pain. In general this is not complained of until after the development of the phenomena already detailed; but in other patients we can scarcely say that the after-pains have ceased, when those characteristic of the disease begin—the one merging into the other; and when this happens, the abdominal uneasiness is more acute from the commencement. When the after-pains subside before those which are symptomatic of the disease are established, the woman describes her sensations as a soreness of the cavity in general, and not as an acute pain, unless the abdomen be pressed upon, when her sufferings become excruciating. In any case where there is acceleration of pulse, the application of the hand to the abdomen should not be neglected, as it is sure to detect the presence of the disease, where the patient, by considering her uneasiness as after-pains, might not think it necessary to make known her condition. The uneasiness is incessant in the commencement, and is rendered excruciating, even by moderate pressure; but when the case is in an advanced stage, or effusion has commenced, intervals of complete remission from pain, even of many hours' duration, are not unusual, and are apt to lead the inexperienced into a belief that a favourable change has taken place; but unless accompanied by a sensible reduction in the frequency of the pulse, they are quite delusive. In the acute stage the patient is unable to turn to either side in bed without great suffering, owing to the abdominal viscera being compressed by their superincumbent muscles, which are thrown into action during the change of position. The pain generally begins in the region of the uterus, and darts towards the ovaries, ascending, as the disease advances, to the umbilicus, and thence into the epigastrium.

Hysteritis in a mild form commences about the same period after delivery, and with symptoms like those of peri-

tonitis, with the following exceptions; that at first the uneasiness is more acute and circumscribed, the pulse more rapid, and the lochia more sparing. After the deeper structures of the organ, however, are involved, the symptoms, as will be noticed hereafter, experience a marked alteration.

When the *uterine appendages* alone are the seat of morbid action, the symptoms at the commencement differ little, if at all, from those of simple peritonitis. At first the pain is acute, and limited to either iliac region, darting frequently, however, towards the uterus, loins, anus, and thighs. The stage of excitement does not continue so long as in peritonitis, and prostration of strength, and other typhoid symptoms, supervene.

Slight tumefaction of the cavity is present from an early period, and it goes on increasing as the complaint advances, until the abdomen is as tumid as before delivery. The uterus is placed upon the brim of the pelvis, evidently enlarged, and exquisitely painful on pressure. This tumefaction of the general cavity is partly owing to the generation of flatus, and partly to effusion of serum, which latter is known to have taken place by a diminution of the pain, and the occasional recurrence of indistinct rigors. The air is chiefly contained in the intestines, very partially in the peritonæal sac.

Another leading symptom is the condition of the pulse, which may be frequent for a day or two, before there is any other evidence of derangement: when it continues excited from the time of delivery, an early attack is certain; but when it is undisturbed after labour, the period of seizure is undeterminate. It should be numbered daily while the disease is prevailing, that the first moment may be embraced to attack the malady, whereby much anxiety and distress may be saved to all concerned. The rate of the circulation is various, but the author never found it under 110 after the disease was established; more frequently it ranges from 120 to 140; when the disease is far advanced, to 160; while in the latter stages, it is almost too rapid to be numbered. At the commencement, it is a resisting or an incompressible pulse; but as the disease progresses, it becomes contracted, compressible, intermittent, and thready.

In the commencement thirst is not troublesome, but as the malady advances it becomes urgent. In most cases there is a troublesome cough, which may generally be considered, not as a symptom of this disease, but as arising from those changes induced by gestation. There is great deragement of the stomach and alimentary canal: at first there

is nausea, rarely vomiting. The disturbance in these organs keeps pace with the abdominal pain, for, as this extends towards the stomach, instead of nausea, we have vomiting, first of frothy mucus, thereafter of greenish matter, and in the advanced stage of fatal cases, a fluid like the grounds of coffee, which is brought up in large quantities, apparently without an effort. What is rejected, especially before it assumes the coffee colour, possesses an odour so peculiar that it is at once recognised by a practitioner of experience; and, as I have often thought, bears a striking resemblance to what may be perceived on entering the apartment of a person who has been vomiting after a night's debauch. The bowels are upon the whole easily moved, and when the fate of the sufferer is too obvious, we have then diarrhœa, which it is difficult to check. The excreta are of a dark brown, green, or ashy colour, and very generally frothy, accompanied by severe tormina, unusually copious, and after they have been received into the utensil, they appear as if fermenting. Diarrhœa is sometimes an early symptom of puerperal fever; it renders the disease more easy and certain of removal, but it will not supersede the employment of active depletion by the lancet. The milk generally disappears, but in occasional instances it continues till within a short period of dissolution.

The urinary organs, in some rare examples, participate in the derangement; the patient, from paralysis, being unable to evacuate the bladder; but this symptom is not indicative of an unpleasant termination. By every professional man of candour, the lochial discharge is affirmed to be irregular in its appearance; but as mistakes frequently arise, and as the attendants do not consider the discharge to be the lochia, except when it is of a sanguineous appearance, the practitioner, when he has any particular object in view, should request the nurse to preserve a napkin for his inspection. The blood first drawn is almost always cupped, and presents a thick, firm, buffy coat, with a large coagulum; but in the latter stages, the crassamentum, which is not so bulky as formerly, is surrounded by a large quantity of greenish serum. At the commencement the countenance is not indicative of suffering; but as the disease advances it becomes expressive of anxiety and distress, and the cheeks present a crimson appearance. In most cases, the intellectual faculties continue unimpaired to the last; patients are alive to every thing around them; and when they are not so, the first evidence of derangement is unusual loquaciousness.

The period at which the disease terminates fatally is less regular than that of its invasion. When active treatment

has not been resorted to, life may be protracted to the seventh or eighth day; but when a woman has been bled at too late a stage, the fatal event may happen on the second, but rarely so late as the fifth day. Occasionally the attack is so severe, that the system never rallies after the rigor, in which case the patient may die in less than twenty-four hours; and on dissection we discover the abdominal veins, more especially, highly congested. In general there is total cessation of pain for some hours before dissolution, and the surface is covered with profuse clammy perspiration; but sometimes the individual dies in great agony from pains in the uterine region, which, during the latter stages, recur in excruciating paroxysms. Erysipelas is a complication, often noticed by practitioners in this disease, and one which is sure to be attended by an early development of typhoid symptoms.

Symptoms of the Typhoid Variety.—Under this head will be enumerated the phenomena attendant on cases, where we afterwards discover softening of the uterus, first noticed by the late Professor Boer of Vienna; as also those observed in examples where phlebitis and inflammation of the absorbents were detected; since, by the manufacturers of the different varieties, it is acknowledged that a distinction cannot be made without tact, or with very considerable difficulty.

This variety commences on the first or beginning of the second day after delivery, by a sense of soreness, not acute pain, in the region of the uterus, a rigor or succession of shiverings, accelerated compressible pulse, severe headache, listlessness, pallid anxious countenance, a crimson patch on the cheeks, hot dry skin, early incrustation of the lips, teeth, and tongue, offensive breath, difficult deglutition, hurried respiration, excessive thirst, tremors of the face and limbs, lochia almost natural, inability to void urine, early prostration of strength, and mental aberration. There is far less animation of countenance in this than in the acute variety, the eye is bedewed with tears, and the pupil dilated. The patient is quite indifferent to every thing around her, never inquires for her infant, a vomiting of greenish matter shows itself early, the surface presents a peculiar sallow appearance; and as the abdominal uneasiness is neither acute nor diffuse, this variety, as it thus commences insidiously, is often in an advanced stage before we are scarcely aware of its presence. Although the sufferings of the patient be not acute at first, the latter stage, in fatal cases, is occasionally distinguished by paroxysms of violent pains in the hypogas-

trium, alternated by intervals of almost total immunity from suffering, which state is a sure indication of the muscular structure of the uterus being involved. *Numerous complications* may attend, more especially, epidemic attacks of this variety. Tonnellè, under the denomination ataxic, from their irregular form, describes cases which assumed all the phenomena of the very worst variety of puerperal fever; but in which, on dissection, all the organs of reproduction were sound. The symptoms were great restlessness, delirium, and prostration, alternating with one another; fits of syncope, and of suffocation, with temporary affections of the circulation, and increased temperature.

Though, in the present variety, cerebral derangement is frequent, yet structural lesion is so rare that, in 266 cases, Dugès found the arachnoid coat inflamed only once. Danse has occasionally discovered mollescence of the organ, and Lee purulent infiltration into its substance.

The organs in the chest present numerous lesions. Tonnellè discovered pleuritis in 29 cases; serous effusion in 8; sanguineous effusion in 6; pneumonia in 10; tubercles in 4; abscess in 8; gangrene in 3; and pulmonary apoplexy in 2. According to Nonat, the lungs may be condensed and infiltrated with purulent matter; or, as stated by Ferguson, softened, as if affected by gangrene. By this last writer the heart is said to be often enlarged, softened, and the pericardium to contain lymph and serum.

Various organic changes have been discovered among the abdominal viscera. The mucous coat of the stomach is sometimes inflamed, and reduced to a pulp; and the tunics of the organ may be perforated: the two former conditions are far from being rare in various portions of the intestinal tube, where we sometimes find the mucous tunic so disorganized that it may be readily detached, even by the back of the knife. The liver may be congested, the seat of abscess, or softened; the spleen and kidneys have presented similar changes; and the ureters and bladder may be involved, but they are oftener affected with pain and congestion, than structural lesion. The most remarkable morbid mutations that sometimes accompany the present variety are abscesses, and sero-sanguineous infiltrations: the former may be seated in the various joints, less frequently among the muscles and cellular membrane of a limb; the latter among the muscles and cellular membrane only, circumscribed in extent—the extremity, in consequence, presenting an erysipelatous appearance.

Predisposing causes.—Pregnancy, from the great changes

which it occasions in the general system, as well as those that supervene to the termination of this important function, must be viewed as affording a powerful predisposition to the disease. From the time conception has taken place, there is an increased influx of fluids directed to the uterine system; and until the conclusion of gestation, there is a gradual increase of every structure which enters into the formation of this organ. In the peritonæum even, the nerves become distinct, though, from their previous minute size, their existence in this tissue, in the unimpregnated state, has been denied by some of the first anatomists. In the next place, the nervous system progressively acquires a high degree of susceptibility as gestation advances. And lastly, the fibrine of the blood increases as pregnancy draws near a close, denoting the presence of augmented irritability.

When the alleged condition of the nerves is considered; that the volume of blood in the general system, after the evacuation of the uterus, is suddenly increased; and that the circulating mass, after delivery, must continue overcharged with fibrine, we have here causes sufficiently powerful for predisposing to inflammation. The rare occurrence, and comparatively easy removal of the disease, after premature labour, or uterine hæmorrhage, except when the former has been brought about by design, or the latter by injurious violence, afford striking proofs of the influence of plethora. Of the great susceptibility of puerperal women to febrile affections, we have already noticed the facility with which ephemera is produced; and when we come to speak of diseases of the mammæ, we shall then also have occasion to remark how easily inflammatory complaints are occasioned. Premature suppression of the lochia may be added to the list of predisposing causes.

The exciting causes are very numerous, such as retention, decomposition, and absorption of a part of the placenta; injuries during pregnancy, or at the time of delivery; mental emotions; exposure to cold; the premature use of stimulating food or cordials; lactiform *metastasis;* a noxious constitution of the atmosphere; infection; and, in short, whatever may produce inflammation in any other state. The author must regret, that the space which requires to be devoted to other subjects, will not permit him to enter very minutely on the consideration of the question of infection; but in reference to the other causes, he trusts it will suffice to offer some very general remarks, as their power of exciting inflammation is universally acknowledged; and because he has been

afforded abundant proofs in his own practice, to satisfy him of their influence.

Retention of the placenta, it has been said, does not produce genuine instances of puerperal fever; but, without enlarging on the subject, it may be recommended to the unprejudiced members of the profession, to compare examples arising from this cause, with those originating under other circumstances, and they will speedily be convcined that occasionally one of the worst varieties of the disease has no other source.

Under the head of injuries during gestation, or at the time of delivery, may be included cases in which labour has been protracted, or laborious. Though, without doubt, the disease may affect females after an easy delivery, it is equally certain that it will seize, in a greater proportion, those who have endured most suffering,—a difference easily accounted for, by taking into consideration the effects of pressure, from the frequent introduction of the fingers, from instruments, or from the long detention of the fœtal head. Of 85 individuals who had the disease in the practice of the author, 29 were confined for the first time, and the remaining 56 had children previously; of the former, who must have been longer in labour, 9 died; and of the latter, who had an easier time, only 13 were unfortunate. There were but few instances where forceps had been employed in the epidemic in question, in which the disease did not afterwards show itself; while I was led to remark, that females delivered by the crotchet, completely escaped it. When embryulcia is resorted to, the parts are soon relieved from pressure; whereas, forceps must continue, and even increase it, by the converging points of the instrument, during the pendulum motion which it exerts, bruising alternately the linings of either side of the pelvis. In further illustration of the injury done to the organs concerned in parturition, the author is in possession of the particulars of several cases, in which the disease might clearly be ascribed to brutal violence, inflicted a little time previous to the accession of labour. By all who have enjoyed extensive opportunities of witnessing the disease, uterine phlebitis has often been known to appear after labours attended with much suffering, whether in consequence of instrumental interference or otherwise.

In regard to mental emotion, of all the causes enumerated, there is none more likely to produce the complaint, when epidemic. Of eight females delivered of illegitimate children, by the pupils of the author, and who afterwards had puerperal fever, only two recovered. It may be easily conceived,

that individuals who are exposed to a variety of mental emotions, while pregnant and in child-bed, are not likely to pass so safely through these states, as females under opposite circumstances.

Puerperal women, from their disposition to perspire freely, are exceedingly susceptible of disease, from premature exposure to cold. And the circumstance of the subject under consideration being almost peculiar to moist cold countries, is a strong proof of it. Many cases have come under the notice of the author, where exposure to cold could be distinctly traced as an exciting cause.

The premature use of stimuli is another agent, of which every man in practice must have had opportunities of witnessing the melancholy effects, more especially among women in the humbler walks of life. During an epidemic it is exceedingly apt to operate.

By lactiform metastasis is to be understood, the translation of the milk from the mammæ to the abdominal cavity, where it was at one time supposed to be productive of the diseased action in which puerperal fever had its origin. When the abdomen of such subjects was examined, a quantity of serous, curdled fluid, was found therein, which was thought to be milk; and to this opinion practitioners were the more inclined, since the breasts had become flaccid. This hypothesis however, was soon rejected, after we had acquired a more correct knowledge of the various terminations of inflammation.

Though not much insisted on by writers on this subject, yet the author thinks that neglecting the primæ viæ may be an exciting cause. In a case of which he witnessed the dissection, about fourteen pounds of feculent matter were discharged from the bowels. The abdomen remained so tumefied after delivery, that the attendants were persuaded the woman had a second child in utero. Into the London Medico-Chirurgical Review for 1824, is transcribed a case of puerperal peritonitis, which supervened to constipation of long standing. On dissection, 13½ pounds, French weight, of solid fæces, were found in the colon, which was a foot in circumference, throughout nearly the whole of its length.

In regard to the action of certain matters floating in the atmosphere, as causes of this malady, it yet remains for the chemical philosopher to elicit what are the noxious principles blended with the air, which possess the power of affecting our bodies in such a variety of ways. With their influence we are too familiar, but we know nothing of their nature, though their effects, in the fearful ravages which they often

commit upon the constitution, are too frequently exhibited to us. But the circumstance, as formerly noticed, of the subject under consideration being called into existence, or the cases aggravated or increased in number, at a time coeval with atmospherical changes, is a striking proof, both of the existence and power of this something, which we may never be able to define.

For reasons formerly alluded to, it is hoped the reader will be satisfied, if the author, in adverting to the subtle question of infection, and confining himself to the result of his own experience, shall offer but a few brief remarks regarding the sentiments of one or two of those who have professedly or otherwise written on this subject. The late Dr Gordon of Aberdeen, whose essay was the first in this country, by which the unprejudiced members of the profession were induced to pursue a mode of treatment more in accordance with the nature of the disease, asserted, that the epidemic treated of by him was produced by a principle of infection, so concentrated, as to be capable of being conveyed by male and female practitioners, from individuals labouring under the malady, to others recently delivered, but residing at the distance of six miles from the new town of Aberdeen, in which it prevailed for several years. This author moreover states, that the infection was as readily communicated as that of measles or small-pox, and operated as speedily as any he was acquainted with. After these confident averments, the reader would not surely expect to be informed by Dr Gordon, that although the infection had been conveyed to a distance of six miles into the country, yet it never found its way into the old town of Aberdeen, though it had prevailed in the new somewhat longer than three years, and though the distance betwixt them is but a quarter of a mile. The author does not mean to call in question the statement of Dr Gordon, as to the disease appearing in certain quarters and not in others immediately adjoining; for he is aware, that when it was very fatal in Edinburgh, there were no cases in Leith; and *vice versa;* and he has reason to know that the same thing happened in some parts of England. But though it is not more possible to explain this circumstance, than the original development of the malady in many instances, yet one thing is obvious, viz. that the assertions of Dr Gordon rather tend to disprove than confirm the infectious nature of the disease in his practice, and to invalidate similar statements by other writers.

The author will next proceed to state, from his own practice, some facts, which, by those who consider the disease to

be infectious, will no doubt be viewed as corroborative of this doctrine, and which he is bound to confess afterwards made a strong impression on himself, though he did not think so much of it at the period of its occurrence. In the autumn of 1821, he attended the dissection of a married woman who died of the disease after an abortion of the early months; removed the pelvic viscera and external parts, and carried the whole in his coat pocket to the class-room; the next morning, *dressed in the same clothes*, he assisted with some of his pupils, at an instrumental delivery in Bridewell,—this woman was seized with this affection and died; the same night, he accompanied Dr Orr to the delivery of a female residing in the North Back of the Canongate, who was equally unfortunate; and three other poor women shared the same fate in quick succession. Similar instances of misfortune occurred in his practice in the summer of 1823, when he was called by two of his assistants, to an instrumental delivery at Canonmills. This woman took the disease and died, though at the time the author had no other cases. He assisted at the dissection; but from the indigence of the people, and their inability to furnish clean napkins, he did not wash his hands with the care he desired; and went, without further attention, on his arrival home, to visit two patients in labour, from whom urgent messages had been received; and both of them were seized with the disease and died. Other medical men in Edinburgh, who experienced misfortunes of a similar nature, were thence convinced of the infectious character of the disease, and for a time relinquished midwifery practice altogether. The author, however, from having to superintend the instruction of his pupils, could not adopt this alternative, even if he had been inclined, but continued his avocations; yet in due time, the scourge disappeared from his practice.

Having said so much for those who consider the disease to be infectious, it will be necessary to state the sentiments of a few of such as are opposed to this opinion. Dr Hulme, one of the first who professedly wrote on puerperal fever in this country, and who is allowed to have described it most accurately, asserts that it is not more contagious than inflammation of any other part of the body; and Dr Leake, writing in the same year, seemed anxious to prove that the disease was owing to atmospherical changes; but at a later period, he admitted that there might be an acquired contagion. In consequence of its prevalence in London in 1787–8, the late Dr Clarke came to the conclusion, that although its non-contagious nature could not be determined, yet it un-

doubtedly appeared as an original disease, in females who had no intercourse with those labouring under it. Dr Denman admitted that sometimes it was, and at other times was not of a contagious character. The medical officers of the Maternité Hospital at Paris, when this complaint appeared there on an extensive scale in 1828–29–30, scouted the idea of contagion; for neither this nor any of the causes usually assigned by British practitioners, could be traced. Neither did it seem to be connected with any particular state of the atmosphere; for it was absent and present during every kind of weather.

To speak from what occurred within the sphere of his own observation, the author does not think that the result of his experience is calculated to afford much support to the doctrine of infection. The epidemic, in which he acquired the greater part of his information, commenced in Edinburgh during the spring of 1821, and continued to prevail in various degrees of violence for more than three years, for the greater part of which time, the deliveries by his pupils generally amounted to two daily, and sometimes even to five, six, or seven; and although himself and his assistants were in the constant practice of being present and aiding the young gentlemen, and that too while they had patients affected with puerperal fever under their superintendence, not more than about one in ten were seized with it. And when the author states, that neither he nor those who assisted him adopted any precautions to prevent the dissemination of the disease, or its being conveyed from one patient to another; that almost all those who were attacked, in his practice, were among the poor; that many of them were destitute of the ordinary comforts of life, as changes of linen, and proper nourishment; and that nearly all of them resided in quarters of the town, the stench of which, from want of ventilation and cleanliness, was intolerable, it will surely be admitted, that if the malady be infectious, such a principle can only exist in a mild degree, since, although every circumstance was so favourable for its generation on the occasion in question, so few, however, were seized with it. Were the infection so powerful as some of the supporters of this doctrine have supposed, the disease would, in a large town, commit great ravages in a short space of time; since, from the intimate and extensive intercourse betwixt the poor, it could not fail to be rapidly and extensively ramified.* It is only neces-

* Dr Orr, a highly gifted member of the profession, who, in the commencement of the epidemic in question, assisted the author, and who is now settled at Belfast, when written to some short time afterwards, observed in reference to

sary for the reader to remember, that acute affections often reign under an epidemic form without being contagious, and if this be kept continually in view, it will prevent his intellects being clogged by that atmosphere of infection, in which many of our members have been enveloped for centuries past. The fact, as already stated, of the disease being in a great measure peculiar to those quarters of the globe which are most remarkable for vicissitudes, and being often also contemporaneous in its appearance with atmospherical changes, will, it is hoped, gradually dispel the predilection in favour of infection.

Though it may readily be gleaned from the foregoing observations, that the author is little disposed to countenance the notion of the disease being infectious, yet, since the occurrence of the cases to which he has in an especial manner adverted in this section, he has on all occasions, for many years, where it was possible, avoided, when present during autopsies of the victims of the malady, taking a share in the examination, and contact with the clothes or bedding of the bodies; and since the adoption of these precautions, he has in no instance been able to trace the disease from one patient to another, either in his own, or the practice of his pupils. For, from the facts referred to, he has long been fully impressed with the opinion, that the disease, though not infectious according to the strict meaning which should be attached to this word, may yet be engendered by the transference of morbid matter, or some other principle, from a diseased to a sound body, either in consequence of a practitioner having assisted at a dissection, or in dressing ill-conditioned sores, and going immediately thereafter to attend a female in labour.

A professional friend from the south informed him some years ago, of a patient having had, under the following circumstances, after delivery, an attack of peritonitis, supposed to have arisen from the transference of morbid matter by the medical attendant, who, when labour commenced, was called away from the dissection of a case of strangulated hernia, in which he took an active share; and he felt so much interest in the examination, that he obeyed the summons somewhat

the contagious nature of the disease; "It may perhaps be worthy of notice, that though I saw Mr Kennedy's patient while alive, was present and assisted at the dissection, attended with you the same evening at Mrs Watt's accouchement, and afterwards accompanied you to visit the woman in Bridewell, both of whom died of the disease; yet Mrs Hislop in the Old Assembly Close, whom I attended on Wednesday morning, never had a symptom of it. Her labour too was tedious, it being the first, and a face presentation. Besides, I saw her daily for a week, though visiting cases of puerperal fever almost constantly."

tardily; wherefore, the child was born before his arrival, so that the only duty he had to perform, was the extraction of the placenta; but nevertheless the patient had a severe attack of peritonitis; and several other women who had been delivered by the assistant of this practitioner, and who also had been at the post-mortem examination referred to, were likewise seized with puerperal fever. Mr Storrs of Doncaster, and Dr Payley* of Halifax, have each recorded cases of the disease, some of them proving fatal, engendered under the alleged circumstances. The cases of the former gentleman appeared during his attendance on a patient affected with erysipelas, in whom he opened several large abscesses resulting from that disease, which was then epidemic at Doncaster; and Dr Payley's cases commenced while the practitioner by whom they had been communicated to him, had under treatment a male patient with gangrenous inflammation of the penis and scrotum, whose sores he was in the daily habit of dressing, while delivering some, and attending others in childbed almost constantly, as was also the case with Mr Storrs, from whose sphere of operations puerperal fever only ceased by his having temporarily relinquished practice.

The most extraordinary ideas have occasionally been advanced, even in the present age, regarding the nature of this affection; the ancients, indeed, entertained a more just conception of it than some men of the present day. Until a late period, in this country, at least, those who wrote on this disease in Britain and elsewhere, considered it as inflammatory, bilious, specific, or peculiar, mixed, or of a typhoid nature. In 1822, the author wrote a treatise on the subject, in which he proved, by numerous cases and dissections, that it was decidedly of an inflammatory nature; that this morbid action might commence either in some point of the peritonæal tunic, or in the substance of the uterus, but that, in which ever of these it began, it would soon extend with rapidity to the whole, from the different tissues being in so favourable a condition for excitement. The subject has since been minutely and extensively examined, from the beginning of 1827 to the commencement of 1831, by Dr Samuel Cusack of Dublin, Dr Robert Lee of London, and by MM. Luroth, Danse, Tonnellè, and Duplay, of Paris. And it must be highly satisfactory for the professional public to know, that without any communication betwixt these gentlemen, toiling in different quarters in the cause of science, the result of their respective investigations has been the most complete confirmation of each other's

* Provincial Med. Journ., April 23—May 14, 1842.

statements. These gentlemen, by their investigations, in short, by looking deeper than the peritonæum, have confirmed the inferences of the author, and have proved not only that the investing membrane, but in fact every structure composing the uterus, may be severally or jointly involved; and may, according as the one or the other is affected, give rise to symptoms, differing in their form and gravity. This valuable fact, while it furnishes more correct information regarding the pathology, at the same time explains the discordant opinions of the nature, and the results in the treatment of the disease, published by different writers.

The purely inflammatory, or that of which a copious detail of the symptoms has been offered in the beginning of this section, does not differ materially from the peritonitis of females under ordinary circumstances, or even from that of males; and is not therefore a peculiar disease, as is proved by the labours of some of the most eminent in the art. When engaged in writing his Treatise on this subject in 1822, the author was favoured by Mr Syme, a practitioner of respectability at Alva, Stirlingshire, with the particulars of several cases of the disease. The infant of one of the women who fell a victim to it, also died, as did likewise two females who had been employed in washing the bed and body clothes of the deceased, but who were neither pregnant nor nursing at the time. A similar circumstance occurred at the Royal Infirmary here, when Dr Young had a lying-in establishment within its walls; and also at the Hôtel Dieu of Paris. Mr Dewar, an expert, talented practitioner at Dunfermline, sent, in 1823, to the author, the outlines of fourteen cases of puerperal fever, which happened in the spring and summer of 1822. Several of them proved fatal, and two males who died at the same time, had symptoms precisely similar to those under which the women suffered; one of them was examined, and making allowance for the difference in the sexual organs, "and the *test*," *alias* the *lochia*, the appearances were exactly the same as in the females who fell victims to it. The late Mr John Hunter, who is no mean authority, was accustomed to inform his pupils that the disease which proved most fatal to females in child-bed, was an inflammation of the peritonæum, commonly called puerperal fever, but that this complaint was not peculiar to women in child-bed, for that he had himself witnessed it in males after paracentesis abdominis. Dr Dease, of Dublin, states, that operations for the stone, and punctures in perinæo, in order to relieve retention of urine, are often attended with a fever, and making allowance for the difference of sexes, &c., with all the other symptoms

of puerperal fever; and on dissection, the omentum and intestines have often a more inflamed and gangrenous appearance than the bladder; and the same purulent and wheyish kind of fluid is found extravasated in the cavity of the abdomen. Dr Dease says, at the very time I was employed in writing this section of my work, "I cut a boy for the stone, and the great similarity of the symptoms that succeeded the operation, to those of puerperal fever, struck me exceedingly." Dr Foster of Dublin mentions, that he has seen many cases of peritonitis, not only in the pregnant state, but some in males, and has been present at dissections of bodies who fell victims to the disease in both instances, where not only the general diagnostic symptoms had been, but also the morbid appearances after death, were the same as are generally met with in a multiplicity of cases of puerperal fever, and in many dissections of bodies who have died in it.

Diagnosis.—There are several complaints with which the varieties that have now been noticed, may be confounded, as colic, intestinal irritation, ephemera, after-pains, and hysteritis. *Colic* is distinguished from peritonitis and inflammation of the other tissues, by amelioration of pain on pressure, the uneasiness being limited to the umbilicus, and not being constantly present but recurring in paroxysms, and the pulse being unaffected. *Intestinal irritation* is very apt to be mistaken for the disease under consideration, in consequence of the abdominal uneasiness and the acceleration of pulse; but they differ however, in many obvious respects,—the secretion of milk and lochia being unaffected, the countenance free from anguish, the pulse but very little accelerated, the abdomen puffy and certainly not distended, nor increasing in tumidity, disturbance not commencing very early after parturition, the uneasiness in this cavity general from the first, and not confined to the hypogastrium, nor rendered acute by pressure, the tongue of a red fiery aspect or but slightly loaded, flatulency, distressing tenesmus, and excessive irritation at the extremity of the rectum, with dark offensive excreta. *Ephemera* can scarcely be confounded with any variety of puerperal fever; for in the former there is no abdominal uneasiness, and the rigor is the only symptom common to both. After-pains are readily distinguished from puerperal inflammation, by the pulse being quiescent, the pain having been present from the time of delivery, but gradually diminishing in severity, returning in paroxysms which are alternated by intervals of perfect immunity from uneasiness, and not being diffused over the cavity but limited to the uterine region. *Hysteritis* in its most simple form may, at the commence-

ment, be readily recognised; but as in a short space of time, the morbid action is sure to extend to adjacent structures, whereby the symptoms are as certainly changed, the diagnosis betwixt the derangement dependent on peritonitis and that arising from hysteritis is of secondary importance. If we are early called, or trace the symptoms to their origin, we are sure, when the case was originally one of hysteritis, to be informed that the complaint commenced with marked diminution or suppression of the lochia, acute darting pains in the uterine region, and remarkable frequency of pulse: here, so differently from what happens in peritonitis, the circulation is abruptly accelerated; and the uneasiness is increased, not by the mere application of the hand to the surface of the abdomen, but by pressing the parietes freely against the uterus.

In speaking of pain as characteristic of any one of the varieties of abdominal inflammation, it is highly important to remember, that unless attended by other concomitant symptoms, this cannot always, as correctly stated by Dr Ferguson, be relied on. In some rare instances, as subsequent dissection proved, I have seen extensive inflammation where there was so little uneasiness during life, that had the case occurred in a large institution, rather than in private practice, I should have been disposed to believe, that by some mistake, one subject had been substituted for another. While in other cases, and more frequently indeed, although there be violent pain and other characteristic phenomena, there may be no inflammation, since the symptoms rapidly subside without the adoption of such measures as are known to be indispensable in genuine examples of peritonitis.

On the diagnosis between the acute and typhoid varieties, it is scarcely necessary to offer a single remark, since the former may, and invariably does, pass into the latter in fatal cases, and since the line of demarcation, when they appear under distinct forms in their incipient stages, may be readily drawn by consulting the detail of symptoms characteristic of each variety. The typhoid form is easily recognised by the inanimate eye, dilated pupil, anxiety and distress depicted in the countenance, listlessness, unconcern for the infant, early mental incoherence, compressible pulse, absence of acute pain in the abdomen, until subjected to pressure, and early incrustation of the teeth and tongue.

Prognosis.—This disease may assuredly be considered one of the most fatal that can attack females in child-bed, but there is reason to apprehend that the fatality is increased by the imprudent conduct of the party concerned, and pusillanimous treatment. When we are called late, whether to

patients among the better ranks, or the humbler classes, the prognosis requires to be more guarded than when individuals have been early visited. Cases during an epidemic, in hospitals, early after parturition, after a severe labour, violence previously to delivery, a pregnancy during which the mind has been impressed with the occurrence of some disaster, and illegitimate births, are all far less tractable than when the disease appears under the sporadic form, in private practice, after an easy delivery, during a state of mental tranquillity, after a premature labour, not induced by violence, and an attack which has not commenced until after the excitement dependent on gestation and parturition has considerably subsided. Among the ominous phenomena we may assuredly particularize the early development of typhoid symptoms, delirium or the least tendency to it, unusual loquacity, listlessness, an anxious countenance, indifference towards the child, a recurrence of the rigors, a watery appearance of the eye, dilated pupil, and imperfect closure of the eyelids during sleep; contracted features, crimson colour of the cheeks, brown tongue, offensive breath, hurried respiration, early nausea or vomiting, the rejected matter assuming the appearance of coffee grounds, the pain in the abdomen advancing towards the epigastrium, tumidity of the cavity increasing, and inability to turn to either side in bed, difficult deglutition, indistinct articulation, inaudible voice, cessation of pain, clammy perspiration, subsultus, singultus, and relaxation of the sphincters, are the immediate harbingers of death; but the abdominal uneasiness does not invariably cease before dissolution, for sometimes patients die in great agony.

When the individual is visited very soon after the disease commenced, and actively treated, we may deliver a more favourable opinion; and with the greater confidence, the less compressible we find the pulse. A great deal depends in every case on the period at which the patient is put under treatment, and the punctuality with which the directions of the practitioner are followed; it is of little moment in what stage of the malady the woman is seen, unless we have the co-operation of those around her. An attack after uterine hæmorrhage, unconnected with violence, may be expected to terminate favourably, but when uterine action supervenes to external violence, or the use of forceps is followed by puerperal fever, the attack is severe, and often fatal. The woman being able to turn in bed without assistance, and noticing her infant and the attendants, are tokens of recovery. A reduction of the velocity of the pulse, clean moist tongue, with general perspiration, are favourable phenomena. The

return of the milk to the mammæ and the re-appearance of the lochial discharge, where either has been suppressed, are salutary symptoms.

Morbid appearances.—These vary greatly, and are regulated by the treatment, the duration of the disease, and the habit of the patient. On dividing the abdominal parietes we not only perceive great distension of the intestines from the generation of gas, but we are also made aware of the escape of a considerable quantity of it from the peritonæal sac. If, in a vigorous subject, venesection has not been practised, or but sparingly, and that at an early stage of the disease, we shall find the vessels of the peritonæum minutely injected, the membrane itself incrassated, a copious effusion of lymph on its surface and betwixt the intestinal convolutions, and only a limited proportion of serum in the abdominal cavity. *Secondly*, if the abstraction of blood has been free at an early period, the peritonæal vessels will not be so obviously injected, but the serous effusion will be greater. And, *thirdly*, if bleeding has been practised at a late stage, the peritonæum will appear blanched, and most generally the serous effusion will be very profuse; without which, or the disorganization of some structure, an inexperienced pathologist might be disposed to think, owing to the blanched appearance of the lining membrane, that the evidences of disease were insufficient to account for the event. The serous effusion is most generally turbid, but in some rare instances it is tinged with blood. Independently of the peritonæal covering of the uterine appendages presenting evidences of increased vascularity, and being covered with lymph, we sometimes find the ovaries forming sacs of pus, or nearly destroyed by suppuration. It is necessary, however, to repeat, that it is natural for all these organs, but more especially the fimbriæ of the Fallopian tubes, to be in a high state of congestion during gestation. The peritonæal coat of the uterus is sometimes highly injected, and covered with lymph, the organ itself enlarged, and in some rare instances gangrenous, but more frequently softened to such a degree that its substance is reduced to a pulp. This latter change involves, in some cases, the lining membrane only, while in others the deeper seated structures of the uterus are affected. The cause of this mollescence is disputed, but from analogy, it seems most reasonable to consider it as the result of previous inflammation. Of gangrene I have seen but one instance, where puerperal fever had appeared after an individual had received maltreatment from her husband, previously to the commencement of labour; but softening of the organ is by no

means a rare condition, even after easy deliveries. Another somewhat frequent morbid mutation of the uterus is, *inflammation of its veins*, especially during epidemic seasons. The morbid action may be limited to those of the uterus alone, or it may extend to the hypogastric, renal, or even the cava. The coats of the affected vessels are incrassated, their area much contracted, or in some cases even obliterated, and their lining membrane pale and covered with lymph or pus. The last change to be noticed is inflammation of its lymphatics, which, however, is not so frequent as phlebitis. Tonnellè, in 222 dissections, found the structure of the uterus altered in 197, traces of peritonitis in 193, inflammation of the veins and lymphatics in 110, enlargement of the ovaries in 62, peritonæum unaffected in 29, uterine phlebitis in 90 of 110, inflammation of the lymphatics in 40 of 110, softening of the uterus in 49 of 222. Of 34 dissections by Lee, there was inflammation of the peritonæum and uterine appendages in 26, phlebitis in 14, inflammation of the absorbents in 4, and softening of the uterus in 8.

Collected around the uterus, in the different vacuities in the brim of the pelvis, we often find, in cases of intense excitement, a quantity of thick matter, presenting the appearance of pus; and subjacent to the peritonæal tunic of the cervix, an abundant effusion of lymph.

The omentum does not escape being involved, but on the contrary presents, in occasional instances, evidences of having suffered more than any of the adjoining structures.

The treatment requires to be modified according to the form of the malady, and the stage in which a practitioner is called. In cases strictly peritonæal, the woman must, in a word, be bled to such an extent as shall make a decided impression on the pulse, and the whole of the antiphlogistic plan strictly enforced. It is the opinion of some practitioners, that females in the puerperal state cannot support the loss of blood so well as under other circumstances; but they seem to have forgot that there is in the system, at this time, a superabundance of materials, and that they ought, therefore, to bear it better. An individual certainly becomes more irritable after it, but this is mainly to be attributed to the state of the system, and not to the practice; but of two evils we ought to choose the lesser, death, or a protracted convalescence. When a patient is seen at an early period, very often one copious detraction of blood will subdue the disease. And as an individual in this state is always bled in the recumbent posture, a considerable quantity is generally abstracted before it exerts any influence on the pulse; but

the moment it does so, the flow should be suspended. It rarely happens, therefore, that a tendency to syncope is occasioned by a smaller quantity than twenty ounces, while it is well known, that in many cases a much larger proportion may be procured before this effect is produced. The degree of relief obtained must determine how soon, to what extent, or if venesection is at all to be repeated. If the pain in the abdomen, to the perception of the patient, continues undiminished, or if it is rendered acute by the pressure of the hand, the operation should be renewed at the end of three hours, but not till the close of five, if the uneasiness be sensibly diminished. When the surface of the diseased cavity can bear free pressure without any great suffering, it may not be necessary to have further recourse to bleeding. The quantity to be removed at each successive operation must be regulated by the strength of the sufferer and the urgency of the symptoms. A patient may require the second detraction to be as copious as the first; while at other times, a few ounces will produce the effect required. If after the third bleeding further effusion be deemed necessary, we must trust to local detractions by means of leeches, and the flow from their bites must be promoted by warm cataplasms, which, as they absorb the blood and preserve the bed-clothes dry, must be preferable to any other application. Leeches may be applied to the external genitals and to the anus, and with incalculable advantage to the uterus itself, a practice which, for several years, I have been accustomed to pursue with the greatest benefit. The leeches, by means of a glass tube, can be easily brought into contact with the uterus; and one will produce as great a flow from a mucous structure as four from the external surface. By the foregoing method, leeches may be applied and frequently repeated, where general blood-letting, from its influence being too immediate and permanent, would be unsafe. After a full bleeding, a powerful dose Sol. Mur. Morph. should be exhibited, to calm irritation. In some obstinate cases, Digitalis in powder, to the amount of two grains every third hour, has been ordered in several instances by the author, and continued for more than two days with decided benefit.

If a practitioner be on the spot at the commencement of rigors, no plan can be more judicious than a bath of the temperature of blood-heat, if a patient can support the effort, or otherwise a succession of heated blankets, repeated small doses Pulv. Ipec. Comp., and warm diluents. Venesection must not be resorted to until re-action is established. Till the application of leeches is determined on, the abdomen

is to be constantly fomented by cloths wrung out of warm water.

With the foregoing steps, after re-action has commenced, the use of purgatives is to be conjoined. In the commencement, if the stomach can retain it, the bowels should be unloaded by means of castor oil, whose action should be promoted by the frequent use of the domestic enema, as large and as warm as the woman can receive it. After the bowels have been cleared out, the necessary action should be supported by such medicines as can accomplish this in small bulk, lest we occasion derangement of the stomach, an organ which is apt to become irritable at an early stage of the disease. The object in view can be attained by the alternate use of calomel and scammony, to which an adequate proportion of antimonial powder should be added, to act on the skin. Either of these cathartic medicines may be ordered in doses of from six to eight grains; and to each, five grains Pulv. Antim. should be added. The domestic enema, or one of warm water simply, is to be frequently employed, as it must be highly beneficial, if it were merely to act as a fomentation to the diseased viscera. In some cases, in which, after active depletion, the abdominal pain returned most acutely and by paroxysms, the author has been accustomed to order as an enema a pound of warm gruel; and Ol. Tereb. Volat. ℥ij; instant relief, and permanent benefit were derived from the remedy, after having been once or twice repeated. It has often acted as if a powerful dose Tinct. Opii had been given by the mouth, and was followed by copious evacuations of a bloody mucous appearance. Enemeta of this nature are most useful in dislodging from the intestines that flatus which, in consequence of relaxation, accumulates therein in formidable cases. The failure, after a fair trial, of this medicine by Drs Clarke and Labat of Dublin, has dissuaded the author from its exhibition by the mouth. He has nothing recommendatory to say of Blisters, Emetics, Digitalis in tincture, Tartrate of Antimony, or Tobacco in any form, though all of them have been more or less favourably mentioned by other writers. During some months M. Tonnellè found emetics of Ipecacuan decidedly beneficial, though at other times useless.

From four to six ounces of water, as warm as the individual can support it, should be thrown into the uterus by means of Reid's enema syringe, once in four hours. When acute sufferings are complained of, or when the pains return by paroxysms, twenty drops of Sol. Op. Sedat. should be added to each injection. Throwing warm water into the

womb is an old remedy, and one, when combined either with Sol. Op. Sedat. or Sol. Mur. Morph., which the author has often found beneficial.

In regard to those forms of the disease which are attended with mollescence of the general structure of the uterus, and with inflammation of its veins and absorbents, these, even when detected early, seem, by the concurrence of those gentlemen by whom they have been more particularly described, to be most unmanageable under any kind of treatment. If, from the vigour of the system, and the firmness of the circulation, a practitioner feel inclined to use the lancet, the pulse is to be watched during the flow, which is to be continued or suspended, according to the changes that take place. Should the pulse flutter, become small, or more contracted, the effusion must at once be stayed; but should the beat of the artery, from having been in these conditions, become fuller or more expanded, the flow may be permitted to go on, until the sufferings of the patient are obviously relieved, or until the state of the circulation forbid its further coutinuance. It rarely happens, in any form of the malady, that the system can support blood-letting in a general way, when the patient has been more than six hours affected, before regular treatment has been adopted. When the disease has been fully formed for some time before a practitioner is called; when the pulse is easily compressed; or when typhoid symptoms are early developed, venesection is inadmissible, leeches must then be applied to the uterus, vulva, and anus, and their effects watched, that effusion may be suspended or promoted as the symptoms point out.

For the typhoid variety, M. Tonnellè has found mercurial inunction over the abdomen and thighs, the best remedy. Unguent. Hyd. ℥ij, in portions of ℥ij at a time, were used every twenty-four hours. Of 43 cases, in which this was the principal remedy employed, 14 recovered; and it was not resorted to until blood-letting, leeches, and ipecacuan, were thought to be no longer of any avail. In some of the successful examples, there was decided evidence, not only that suppuration had taken place before the mercury could have exerted any influence, but that there was also uterine phlebitis. Where there is general prostration, instead of depletion, the stimulating plan must be adopted, as the free exhibition of Quinine and Wine.

There are several symptoms which are distressing to the patient, and which, though they cannot be removed, may, however, be palliated. The coffee-coloured vomiting is one of these, for which the only remedy of the least advantage, is

solid opium, which may be given occasionally, in half-grain doses. Diarrhœa is another troublesome complaint, for which chalk Juleps, and small doses of the Tinct. Opii must be allowed; or an opiate enema may be given. For relieving thirst, milk, whey, or rice gruel will be found very eligible. Paracentesis has been successfully resorted to in a few instances, for the removal of the effusion from the abdominal cavity; but unless there be sufficient stamina in the system, it seems a very doubtful undertaking, and has, under such circumstances, much oftener failed than been useful. When the patient has been laid prostrate by the active treatment recommended, she must be ordered a more generous allowance of mild nourishment, with the judicious use of tonics and cordials, when convalescence is complete; but her powers are to be recruited slowly and cautiously, lest an opposite conduct might be followed by a renewal of the excitement.

During an epidemic season, such causes are to be avoided as are likely to give rise to uterine irritation. Above all, the misfortunes of other females in the puerperal state, should be carefully concealed from the patient. In the latter days of her pregnancy, the diet should be simple and abstemious; tranquillity of mind should be observed; and a due degree of exercise in the open air recommended. During labour, there should be as little interference as possible, on the part of the practitioner; and where it may have been deemed necessary to use instruments, the vulva should be fomented for some time afterwards. Independently of strict attention during pregnancy, the earliest opportunity should be embraced after delivery, to have the bowels evacuated. In the first instance, this had better be accomplished by the mildest laxatives, as Castor Oil, or an enema. And finally, as the application of the infant to the breasts causes, for the first few days, much pain of these organs, and sympathetic uterine irritation, it would be preferable for four or five days after birth, that it be suckled by some one else than the parent, or nourished artificially.

Sect. XXII.—*Phlegmasia Dolens.*

This complaint has been little, if at all noticed by writers, before the time of Rodericus-a-Castra, who, considering that he wrote in 1603, offers a tolerably correct account of it; since which time it has been treated of by many other practitioners; but by far the most learned essay on the subject, is by Dr Hull of Manchester, which appeared in 1800. This

singular disease is chiefly confined to females, and more especially those in child-bed; but it has been observed in individuals who were neither pregnant nor nursing; and there are a few examples of males even being affected. Such as are of a lax, delicate habit of body, and women with œdematous ankles, are most disposed to it. Those who have been affected in one confinement, are again liable to it, but the author has met with it in the absence of all these conditions.

The predisposing causes are, *first*, the irritability of the system induced by pregnancy; and, *secondly*, congestion of the sacral extremities, brought about by the pressure of the gravid uterus during the latter months of gestation. The disease is not seen above once in a thousand labours, which may be ascribed to the tranquillity of body and mind, and the recumbent posture enjoyed by the patient after delivery; as also, to the determination which takes place towards the mammæ, the diminution of the fluids of the body, and the removal of the pressure. Under the head of exciting causes have been placed, contusion or long continued pressure during labour, either from instruments, or the protracted detention of the fœtal head; premature exercise with the lower extremities; exposure to cold; the too early use of stimuli; and the over hasty suppression of the lochia. Of all the cases which have fallen under the notice of the author, premature exertion of the lower limbs was what most frequently led to the disease.

The proximate cause, or the nature of the malady, is now better understood than formerly, in consequence of the recent investigations of the late Professor Davis, and Dr Lee. According to the former, this affection consists in inflammation of the large veins in the pelvis, but more especially the crural and femoral veins, which in some instances have been found diminished in diameter, blocked up with firm coagula, or charged with pus. Dr Lee again, is of opinion, that the disease is owing to the morbid condition of the uterine veins, and is communicated to the other large veins in the pelvis and its vicinity, by the internal iliac or hypogastric; but a very obvious objection to his theory is, that in some instances the womb has been found healthy, and that the complaint has been witnessed in males. From the only dissection which the author has witnessed, and the cases published by these writers, in support of their respective theories, he must coincide in opinion with the latter; for it is obvious, that the malady may commence either in the uterine or extra-uterine veins. It must be confessed, however, that as

phlebitis, wherever situated, is a formidable disease, and phlegmasia dolens, on the contrary, generally a mild affection, something yet remains to be elicited regarding the nature of the latter.

As the principal veins have not only been found blocked up with coagula, but completely obliterated and even converted into ligaments, we can easily account for the enlargement of the affected limb, which is a pathognomonic feature of the malady. It arises from an effusion of lymph into the cellular membrane, in consequence of the venous blood being obstructed in its transit from the limb towards the heart. This singular affection begins in either side of the lower part of the abdomen, with a stiffness and painful sensation, which extends towards the sacrum and groins, and is particularly felt on moving the limb that is about to be involved. There is obtuse, not an acute pain, with a sense of weight and tension in the hypogastric region. When the disease is fairly formed, the pulse ranges from 110 to 130 in a minute; but at the commencement it is seldom higher than 90. Sometimes these phenomena are preceded by rigors, which however, are not always obvious. There is generally increased heat, but this is never so considerable as might be expected. From the lower part of the abdomen and groin, the pain extends along the limb to the heel and sole of the foot. In other cases, the uneasiness commences in the calf of the leg, and thence extends both upwards and downwards; and from a record of many examples, the left is oftener the seat of the disease than the right limb. It did not show itself in any instance which fell under the notice of the author, for several weeks after delivery; and of eleven cases, in all except one, in females who had children formerly. Generally the swelling is first observable in the groin, whence it diffuses itself over the external genitals, the nates, and along the limb; and the uterus feels tender or painful on pressure. In some rare instances the calf is the part in which the swelling first appears, whence it extends and increases until the extremity is twice its natural size. Generally the whole limb is affected, but in other cases the tumefaction is partial, and confined to the upper half of the thigh alone. The swelling is at its acme in from 24 hours to three days, and differs in several respects from that produced by acute diseases, and from œdema; as it does not exhibit the inflammatory blush, neither does it pit much on pressure, nor is it increased by a dependent posture; and instead of serum, when punctured the effusion is of a gelatinous consistence. The limb is warmer than the sound one; but as it enlarges it becomes less painful than

formerly. The milk recedes and the lochia are diminished in quantity. As in other diseases of excitement, the appetite is impaired, and the bowels are torpid; but occasionally, there is a diarrhœa.

In from four to eight days, the febrile symptoms and the swelling begin to abate. The upper is first, and the lower part of the limb thereafter, reduced in size, when inequalities are felt along the course of the absorbents. In some instances, however, the extremity continues enlarged for many months or years, while it is felt stiff and benumbed; and for a long time it is more susceptible of cold and fatigue than the sound one. After the reduction of the diseased, the healthy extremity swells; and this double attack is followed by general prostration, and a tedious convalescence, attended by suppression of the catamenia, profuse leucorrhœal discharge, and tumefied ankles. The sudden development of the swelling, and its peculiar characters are sufficient to distinguish this affection from every other in the puerperal state. When the second limb, however is attacked, the prognosis requires to be guarded. In fatal cases we discover extensive lesion of several tissues within the pelvis, as great enlargement and actual suppuration of the internal iliac cluster of glands, and inflammation of the large adjoining veins, or phlebitis extending along the ascending cava.

In the treatment, we have to moderate local excitement, promote absorption in the limb, and support the system. General depletion, in whatever manner it is to be explained, is not suited to the removal of this complaint; which, when the calibre of the crural vein is obliterated, may be ascribed to the system being deprived of nearly the fifth part of its fluids. Except in stout vigorous patients who may be benefited by *one moderate* detraction of blood in a general way, local bleeding must be preferred; and when early resorted to, the disease is rapidly subdued. Leeches in sufficient number are, therefore, to be applied to the groin, and the effusion from their bites promoted by warm emollient cataplasms. The fomentations should be continued until the pain subsides. Every alternate day the bowels are to be gently moved by the exhibition at bed-time, of Submur. Hyd. and Pulv. Antimon., followed up next morning by a small proportion of some saline aperient. To diminish irritation of the pelvic structures, from four to six ounces of water, as warm as it can be supported, should be injected into the vagina once in four hours. The patient must be restricted to the antiphlogistic regimen. To promote absorption in the extremity, it should be bandaged uniformly from the toes to the top of the thigh, and

the roller secured by passing it round the body above the ilia.

Where local bleeding has not been practised sufficiently early, the limb is apt to continue enlarged for a considerable time, even after every acute sensation has subsided; in which case, frictions with Unguent. Hyd. are to be resorted to along the course of the absorbents, night and morning; and much benefit will result from the use of the flesh-brush over the whole surface of the extremity, equally often. The system is to be supported by generous diet, tonics, country air, with salt water bathing, which latter should at first be tepid. To act on the absorbent system, the bowels are to be regulated by the Sulph. Potas. c. Sulph.

Sect. XXIII.—*Mania.*

Though not rapidly destructive to life, this is a disease of a most deplorable character; for, as well observed by a late author, if the possession of reason be the proud attribute of humanity, its maladies must be considered among our greatest afflictions, since they sink us from our pre-eminence to a level with the brute creation.

Both the divisions of this disease, the sthenic and the asthenic, or the furious and the mild, may be seen in the puerperal state; but it has rarely happened to the author to witness the first of these varieties assume so violent a form in puerperal, as in non-puerperal patients. It may be said to consist in a depraved condition of the intellectual faculties, attended with mental emotion more or less severe, of a depressing or elevating nature, but for the most part unaccompanied by acceleration of the pulse, except in females in child-bed. This condition of the circulation, and the more easy removal of the disease, constitute some of the differences betwixt puerperal and non-puerperal insanity.

It may be met with among individuals of every constitution and temperament, as well as females of every complexion; but assuredly those with dark hair, swarthy, mottled complexion, and muscular forms, are the most liable to it; and more particularly such as labour under predisposition. The author can remember only two cases which were exceptions to this description. Though it may be encountered during every season, and every variety of weather, yet it appears oftener in summer than winter; and during hot moist seasons than when the atmosphere is cold and dry. Except once, the author never witnessed a case supervene to severe labour. Those who have had a numerous family are more

liable to it than such as have had but one or two children; but I have seen it in several instances supervene to a primary labour; and in a small number only have I met with it among the humbler spheres of life, though much more frequently among females in easy circumstances, which satisfactorily proves the influence of the mental passions. It is exceedingly liable to re-appear in the future confinements of the same females; who, indeed, are not secure from an attack of it at the lapse of several weeks after delivery. It is more apt to show itself in the middle aged, than in such as are young, or far advanced in years; but the author has seen mania in several individuals who were little more than twenty at the time.

Insanity may be impending for several days or weeks before parturition; and it may show itself in less than twenty-four hours after this event. It is known at the commencement more by an alteration in the appearance of the eyes, than by any other change in the features or conduct of the patient. By an acute observer or practised eye, this symptom is often remarked to precede even incoherence in speech. The eye-lids are thickened, turgid, and frequently moved, or the individual is often observed to wink. There is unusual prominence of the eye-balls, which are often rolled about; the vessels of the adnata are more turgid, and the coat itself of a more flavid colour than in health. Great listlessness is sometimes a primary symptom; the patient lies on her back, regardless of the questions of the practitioner, resolved, as it were, not to reply to them, when all at once, from a state of the most profound silence, she launches forth into a paroxysm of the most boisterous volubility, obscene, or blasphemous language. The muscles of the face are sometimes affected to such a degree in this complaint, as to give the sufferer the appearance of great ferocity. With few exceptions, the mass of maniacal patients are not very susceptible of the extremes of heat and cold, nor of the influence of diseases supposed to be infectious. The countenance is generally flushed; the tongue yellow, moist, and coated, except its margins and apex, which are very red. The saliva is of a creamy consistence, and scanty, but the thirst is not urgent. Though under other circumstances the appetite is voracious, yet it rarely is so in puerperal patients. Constipation generally prevails, except when the disease is about to take a favourable turn, when a diarrhœa, containing portions of scybalous fæces, is ushered in, which possesses an intolerable odour. The urine is high coloured and cloudy; the milk recedes, and the lochia are diminished in

quantity. In most cases the pulse exceeds a hundred, but there is no heat of skin; there seems a want of energy in the vascular system, though the circulation is accelerated. For a few nights at first, the individual, in most instances, is observed to be very restless before there is any obvious mental aberration; and often the first circumstance which creates suspicion, is her unusual loquaciousness. Sometimes she suddenly awakes from sleep as if frightened by a dream, and calls for her husband or child; which latter is a frequent topic of conversation in her delirium, and which she declares to have been stolen or murdered. And if, with a view to relieve her anxiety, it is presented to her, she will not believe it to be her own, but the infant of some one else in the clothing of her own. This excites her temper, and though remarkably devout when sane, she now launches forth into such a torrent of obscene language, that one would be astonished that respectable females could have become familiar with such expressions. In some cases the patient never inquires for her infant. As in mania in the non-puerperal state, so in this, the friends of the woman when she is sane, she considers her greatest enemies when she is deranged; and accordingly, how often do females in this state attempt the destruction of their husbands!

It is impossible to describe the various shades which are to be observed in this malady. In many cases it is difficult to keep the patient in bed; and the exhibition of medicine and nourishment is often long resisted; but if we are aware of any thing which she is desirous of possessing, we promise to gratify her wishes, if she will only comply with our requests, and our object is thus generally attained. There is often some one particular subject which is a continual topic of conversation, and on which the sufferer resons with tolerable correctness for a little; but her mind is suddenly arrested by some irrelevant idea, or a violent fit of passion. Except in the worst forms of the disease, her emotions may be controlled for a little. With few exceptions, sthenic puerperal maniacs recover after the lapse of various periods; but when they do not, the termination is in Asthenia, or Melancholia, or Idiocy, in which condition the patient may remain for a long series of years, or for life. The causes of such unfortunate terminations are starvation, various violent evacuations, and the disease being long neglected.

There is *one powerful predisposing cause* in every puerperal patient, and this is the irritability of the nervous system induced by pregnancy, which continues to prevail for some time after delivery, and is sufficient of itself, without the

joint operation of any of those conditions supposed to be transferred from parent to offspring, more especially where exciting causes of a violent nature have been allowed to act; nor must we overlook the effect, at this particular period also, of the contending passions of fear and joy. There are no purely mental causes, as has been too often inferred, for every case may be referred to some corporeal derangement. But it will naturally be asked how it happens that causes or changes, apparently strictly mental, arising from the excessive action and powerful influence of passion, should seem to induce insanity; to which we must reply, that it is the condition of the body alone which modifies the result of every forcible impression made upon it, and not the excitement that determines the corporeal state; for all human passions are the offspring of impressions made upon our frame; and mind itself is the product of bodily sensation. To afford any explanation of the multifarious shades of difference which present themselves in this disease, it is necessary at all times to remember how liable the body is to numerous changes from causes not less manifold.

The exciting causes most obvious to us are fear, anger, disappointment, profuse evacuations by the lancet, or from the uterus. The author has witnessed several cases which supervened to copious venesection for the removal of puerperal fever, and one example after profuse uterine hæmorrhage.

In regard to the *proximate cause*, we can advance little beyond conjecture. It is a very general opinion that the brain is the seat of disease when it appears under the sthenic form, but no dependence can be placed on any appearance exhibited by this organ, nor on the accounts afforded us by some of the most celebrated anatomists; since, on the one hand, maniacal patients have been known to expire under the most violent disturbance, apparently of the brain, without the slightest lesion of this organ being discovered on dissection; and since, on the other, the cerebral system has been seen universally diseased without any mental derangement. We may take an illustration from the other sex, and instance the extraordinary case of Mr Kay, No. 226, Lond. Phil. Transac., in whose cheek a cancerous ulcer commenced, destroyed his eye, penetrated the *os frontis* and *dura mater*, and continued so long, that gradually the whole brain was consumed; and when he died there was nothing found in the cranium but black putrid matter; yet he lost no sense, nor the motion of any organ, nor had he any convulsion or spasm. In other instances, the cranium, on examination, has been found almost completely deprived of its contents;

and in some animals it has been filled with ossific matter, yet the functions thought to depend on its integrity were not impaired. From the occurrence of such cases, there is some excuse for those who have assigned the seat of the soul to the stomach, plexus solaris, and other organs; but we may take it for granted, however, that the brain and its emanations are the parts most intimately connected with the intellect, and that some morbid change of these exists in every instance of insanity, though generally so attenuated as to elude our search, in parts whose organization is so delicate and complex. But the brain and nerves are not the only organs, since many others have been found to participate, as the liver frequently in the male, and the uterus in the female sex.

The prognosis may in general be favourable, for unless the patient has had successive attacks, the disease subsides, sometimes in a few days, but in most instances in a month or two; but when the individual has been seized with it after several accouchements, it may continue for many months, or even become permanent. A guarded prognosis is required where the furor is violent and incessant; where the mental aberration is connected with religious enthusiasm; where the system is with difficulty acted on by medicine; where the disease is preceded by violent pains in the head, more especially the cerebellum; and where the pulse, instead of being more frequent, is slower than usual. Conception is generally succeeded by sanity, but where an individual has been insane after several deliveries, the procreative organs seem impaired, for a considerable period intervenes before the individual conceives.

Mania of the Asthenic, or Melancholic form, is generally confined to spare, delicate subjects; it is rarely met with in stout plethoric individuals, except where the sthenic, by injudicious management or otherwise, has degenerated into melancholia. This form is not met with in the puerperal state, for it is chiefly confined to females who are too old to be impregnated. Recovered melancholics describe their malady as having commenced with pains which are sometimes fixed, sometimes fugacious, but generally very distressing and unremitting. Occasionally the attack is preceded, at other times succeeded, by lapses of memory. Sometimes the individual seems as if intensely absorbed in thought; or she is continually dwelling on some mournful topic, perfectly regardless of every thing which, in a state of health, is wont to interest her. Extreme anguish tortures her mind by day, while restlessness and the most horrific dreams destroy her repose by night. Sometimes she persists in silence, and en-

deavours to avoid the intercourse of her friends, whom she considers her enemies. This state may continue for some time before the conversation or actions of the sufferer excite any suspicions of what is on the eve of declaring itself. Sometimes she complains of pain in the hypogastric or epigastric region; or she says, that she feels her stomach, heart, or womb in a flame. This frequently is the first warning we have of the deplorable condition of the patient; and such complaints continue for some time her constant theme, when on a sudden religion becomes a continual topic; she expresses great concern for the safety of her soul, and for her sufferings in a future state. Sooner or later, when she is at all conversable, a pain is complained of in the head; and from this time, her actions and conversation are too characteristic to be mistaken. When there is pain in the uterine region, it is accompanied by leucorrhœa, and sometimes irregular catamenia. In asthenic the general temperature is lower than in sthenic insanity, but the countenance is occasionally flushed. The face has a silly appearance; the tongue is coated with brown fur, except its apex and margins, which are intensely red; and though the saliva is so copious as to overflow the mouth, yet there is a great desire for cold water. In this, as in the former variety, there is obstinate constipation, except when the disease is about to undergo a salutary change, when a most offensive diarrhœa is ushered in. The patient is much annoyed with flatus, which possesses an intolerable odour, and is expelled in immense quantities by the mouth and anus. In this, as in the other variety also, the secretion by the skin has something so peculiarly offensive in its odour as to be immediately recognised by those who have once attended the insane. The pulse is feeble and irregular, and ranges from 110 to 130. The delirium is limited more to one subject than we find it in cases of the sthenic form.

Melancholia may terminate in Palsy, Dropsy, Phthisis, or Suicidal Death; whereas the most usual termination of the first variety, when health is not restored, is chronic incurable insanity. Independently of the two forms differing in the degree of violence of their symptoms, there are other marked distinctions. Those suffering from melancholia are more timid and reserved, more susceptible of cold and heat, and more selfish and parsimonious than the sthenic. *On the prognosis* I need only say, that this variety is much more obstinate of removal than the former. Nor is it necessary to say any thing regarding its causes, since it is a mere modification of the former variety.

In the treatment, it is of the first consequence to remember

that the two varieties will require very opposite methods, lest, by injudicious conduct, a case of the high form might be converted into one of a chronic incurable description; and in the second place, a practitioner should never lose sight of the important truth, that the earlier such patients are subjected to regular medical management, the greater will be the prospect of speedy and permanent relief. For it is now well known to the public, as well as to the profession, that no cause more frequently than this last, has given rise to want of success in the removal of the disease.

When patients labouring under the sthenic form are violent, their personal security should engage the attention of the practitioner during the first remedial steps, in order to prevent injury to themselves or to those appointed to minister to their wants; and for the same reason, weapons of every description should be placed beyond their reach. The strait-jacket must be applied, when the subject is so unmanageable that she cannot be kept in bed. When this precaution is adopted, the patient supposes that it is intended as a species of punishment, an impression which we must endeavour to remove by representing that the object is to prevent her injuring herself or others. And to retain her confidence and good opinion, the practitioner and future nurse should be absent when her constraint is to be effected. At the first interview thereafter, she will of course complain of the harsh treatment she has experienced, when we are afforded an opportunity of sympathizing with her, and promising to restore her to the enjoyment of her former privileges when all risk of doing herself injury is at an end. This mode of acting is indispensable, that we may acquire such influence over the patient as will enable us to prevail upon her to take medicine, or conduct herself in any manner which may be required to ensure success in the treatment. By a conciliatory manner the most violent maniac may be brought under subjection. A firm but soothing conduct will accomplish a great deal; harshness should never be exercised towards this class of sufferers, not only because such usage is uncalled for, but because it invariably aggravates their sufferings by producing temporary excitement. Even where such patients have transgressed any particular regulation, no further notice should be taken of it than the adoption of such measures as shall prevent its repetition. On this account it will be found of the first consequence to select as a nurse for such individuals, one of their own sex, who is known to possess great command of temper, a cheerful disposition, real tenderness of feeling for suffering humanity, and a good share of corporeal and mental activity.

When a patient resists the exhibition of medicine, we almost always succeed by stratagem, such as promising her the possession of the infant if she desire it; the author has never witnessed an instance in which it was necessary to have recourse to force, as is occasionally required in individuals of the other sex. Every effort must be made to preserve her mind in a state of tranquillity, and on this account the nurse is not to attempt converting into a regular train of conversation any expression which may fall from the patient, while every remark which has the least tendency to bear on the subject of her malady, must be carefully avoided. When the delirium runs high, the apartment must be obscured, and she is not to be addressed except when it becomes necessary to minister to her relief; and even then, as little as possible. To secure tranquillity of mind the more effectually,every thing should be conducted throughout the dwelling with as little disturbance as possible; the ringing of bells should be prohibited; and to accomplish the object in view the more certainly, the patient should be placed at as great a distance from the street as circumstances will permit. But as strict quiet cannot be commanded in town, the individual should be conveyed to a retired country situation, whenever she has sufficient strength for the effort; and she should be placed as much apart as possible from every object, person, or scene, of which she has had any previous knowledge. And those practitioners who would sincerely wish to benefit their fellow-creatures, will strenously oppose sending patients of this description to an asylum, which, when, a lucid interval discloses to them the nature of their situation, may be the cause of their becoming perpetual tenants of mansions which they ought never to have entered. A private family, where they will be tenderly and conscientiously treated, ought at first invariably to be preferred; an asylum should ever be the last alternative.

In regard to the medical management, few remedies, farther than such as are required to preserve the alimentary canal in a proper state, are needed; and strict and early attention to this point constitutes one of the principal objects of a practitioner in such cases. At one period, venesection was highly lauded, and practised so lavishly, that it was difficult to determine who was most in need of a physician, the practitioner or the patient. Except in full vigorous females, it is a most injudicious proceeding; and even in them, it should not be carried farther than one moderate detraction. When, in consequence of flushing of the countenance, a loaded condition of the eyes, and vascular excitement, deple-

tion is indicated, the system must be reduced by free purgation, low diet, and the application of leeches; or under urgent circumstances, one or two cupping-glasses over the back of the neck. If any proofs were required to show the impropriety of profuse evacuations by the lancet, they are afforded by the fact, that mania has been induced by the practice, in persons who were previously sane. A brisk aperient should be administered every alternate day; and it must be remembered, that owing to the difficulty of acting on the bowels of the insane, more than double the ordinary dose must be ordered each time. The drastic purgatives answer best; Senna, Jalap, Colocynth, Scammony, Gamboge, Calomel, and Tartrate of Antimony in solution with some neutral salt, may all be given alternately. The last formula is one from which the author has seen much advantage accrue in many cases, and more particularly those attended with plenitude and activity of the system in general. He has known the Tartrate of Antimony administered to the amount of seventeen grains, in half-grain doses every alternate hour, before there was any disposition to sickness. Deep nausea, supported for some hours in patients of vigorous stamina, is a most beneficial remedy, more especially when the mental aberration is violent. Besides interrupting by its effects the train of erroneous idea, it acts powerfully on the circulatory system, and on the skin and bowels.

When the sufferer complains of pain, and her arms are secured, they should be set at liberty to enable her to point out the uneasy part, on which a small blister must be placed. These remedies are highly useful, by diverting the attention of the sufferer from her illusive ideas, to her more acute sensations; and on this account, a succession of them will be found preferable to protracted inteneration. Moreover, it is a source of satisfaction to such patients to have their complaints, whether real or imaginary, engage our attention; for there is nothing which offends them more than to suppose themselves neglected, or to have their wishes opposed. Camphor has been highly lauded in such cases, but it has invariably disappointed the author; he thinks, however, from its well known influence in diminishing nervous irritability, that it promises to be a medicine of great value, were its use commenced before the disease shows itself; but from the unwillingness of friends to disclose such a misfortune, we are seldom acquainted with the situation of such patients until the disease declares itself. When administered, the dose should be a scruple every third or fourth hour.

The diet is a point of great moment to be properly regu-

lated. When the patient is stout and full, it should be bland and abstemious, but never approach to the starvation system. For breakfast, pottage and milk, or tea and dry toast may be allowed; and the same for supper; and for the intermediate period of the day, bread and milk, rice and milk, or boiled pearl barley and milk. We are carefully to observe whether the individual be losing flesh by this regimen, when she must have a small allowance of animal food every alternate day. Starving maniacal patients, of whatever description, has been found to prove highly injurious, by plunging them into a chronic incurable state, on which account the system should neither be abruptly nor too much reduced. Another point highly necessary to be attended to is personal cleanliness, which must be enforced in despite of every opposition. In cold weather, the body must be sponged daily with tepid water; and during the warm season, cold water should be substituted for the tepid. The body linen is to be frequently changed; bed-curtains are to be dispensed with, and the bedding and the apartment often aired. Among the attentions required by the patient, the alvine secretions are not to be lost sight of; they are to be inspected daily, if it were merely to make certain that they are regularly voided, since they are often obstinately retained, and sometimes also neglected by the nurse. It is a matter of great importance to procure rest for such patients; but the largest doses of opium, or of any of its preparations we can venture upon, are insufficient. The medicine that has been found most successful in inducing sleep is Belladonna, in doses of two grains, in two ounces of Saline Mixture, at an interval of two hours, three times in succession.

When convalescence is established, such patients should be encouraged to take exercise in some retired situation in the open air, at first secluded from public observation. Walking may always be considered a useful variety; and if it be the time of the year for gardening, she should be encouraged to pass a short time daily in cultivating flowers; and she may be enticed to indulge for a little time also in some light reading, drawing, or music; or in botanical excursions, if the season of the year answer. The works selected for perusal should embrace some object as much opposed as possible to that towards which her delirium verges; and on this account, when the train of illusion runs on religion, publications of this nature are certainly not the most proper, until health is completely restored. When bodily vigour has returned, there is no method so useful in diverting the mind

of the patient as travelling by easy stages over a country hitherto unknown to her.

In the management of melancholic patients, the same steps as to the removal of all weapons which might be converted to a dangerous or destructive purpose must also be observed in their case, since they are often obstinately determined on self-destruction, or on destroying some near friend, probably their husband. Patients of this description should be removed as early as possible from among their intimate acquaintances, to a quarter where every thing is new to them. The most melancholy consequences have been known to result from a neglect of this precaution, and from restoring the individual prematurely to her family or friends. The situation most proper for such subjects will be sufficiently understood from what has been stated in reference to the furious form of insanity. The same attention to personal cleanliness, and to the state of the bowels, must be observed. In the asthenic, the alimentary canal is fully more torpid than in the sthenic insane, and therefore requires the use of the strongest drastic purgatives. The qualification of a nurse appointed to take charge of such subjects, must bear some comparison to the intelligence of the mental sufferer, when in health. If the patient be not of a literary turn of mind, a plain unlettered woman, provided she is good natured, affable, and agreeable in her deportment, will constitute every requisite. The regulation of diet in those cases also, is a point which should engage the particular attention of the practitioner. In this order of patients, it must be of a more generous nature from the commencement; the individual should be allowed a little plain animal food every alternate day, and some light soup daily. But her health requires to be carefully watched, that we may discover any tendency in the malady to verge towards the sthenic form, in consequence of returning vigour in the system, when the diet must be regulated accordingly. Excitement must be subdued, when necessary, by regimen, purgatives, and nauseating doses of Antimonial Tartar. Emetics, so highly serviceable in non-puerperal examples, cannot come into contemplation in puerperal cases; even purgatives are not to be carried so far in this as in the high form; but it must be remembered that the asthenic require larger doses, when such medicines are administered. The resinous gums answer best. Here also pain, whether real or imaginary, is to be relieved by a succession of small blisters. When there is extreme debility, by whatever cause induced, Quinine, or what the author has found more eligible, some of the warm

aromatic bitters, as Colombo, or Canella Alba, should be allowed, either in watery or vinous infusion, according to the degree of debility. To females who have been habituated to luxury, one or two glasses of sherry must be allowed daily. Exercise, in any manner which may be preferred by the patient, should be recommended from an early period; and the same regulations as to the occupation of her mind are to be observed as in the sthenic sufferer; but except when she retires to rest, she should be constantly under the eye of her nurse.

When a female has been insane in one confinement, she should withdraw, in that next approaching, to some retired situation, where she will be effectually sheltered against that tumult and noise inseparable from a town residence. All idea of nursing should be relinquished from the first, and the individual should engage as little as possible in domestic matters. A plain abstemious diet should be recommended; strict attention must be paid to the state of the bowels; foot exercise should be daily indulged in; and mental emotions are to be sedulously avoided at all periods. Camphor should be commenced for a few weeks before, and continued for an equal period after delivery.

Sect. XXIV.—*Phthisis.*

This disease may either be suspended or accelerated by gestation; more frequently, however, it is arrested; but after parturition, it makes rapid progress. In some rare instances, the individual improves in her general health until the succeeding delivery, when the malady rapidly runs its course. Generally, the contents of the uterus are prematurely thrown off, some time during the latter months, partly in consequence of the general irritation, and partly also, from the inability of the system to furnish materials for the development of the uterus. The same symptoms which characterize the disease on other occasions, and which are sufficiently familiar, not only to the profession, but to the community at large, are present both before and after delivery. The sufferings of the patient, from the succussions arising from perpetual coughing, are most distressing. As the malady advances, the lower limbs become œdematous, the voice hoarse, the cough incessant, the eyes sunk, and of a clear, pearly aspect, the features shrunk from loss of substance, the cheeks of a crimson colour, the milk is secreted, but it gradually recedes. The expectoration is profuse, which, with colliquative sweats and diarrhœa, quickly exhausts the sufferer. The fatal event

generally happens within three or four weeks after delivery: the author has known the patient sink on the second and third day; and though the system be much relaxed, he has never witnessed uterine effusion to any extent. Though her general appearance indicates but too clearly to every one around the speedy termination of life, yet in her own estimation, her health is daily improving. The cough and diarrhœa are to be palliated by opiates, but the preparations must occasionally be varied, that the patient may not take a dislike to any one of them. Pain in the chest is to be relieved by blisters; and to avoid offending the stomach, the bowels are to be regulated by enemata.

Sect. XXV.—*Syphilis.*

Occasionally this disease is encountered in puerperal women. During pregnancy it not only disappears when it exists as an eruption on the skin, but even large ulcers cicatrize. The virus can seldom be eradicated during gestation, more especially in females with a predisposition to abortion, from mercury being so apt to excite the uterus. Neither can this affection be removed in a woman who has had a numerous family; and though it disappear during pregnancy, it is sure to show itself sooner or later after delivery in the form of eruption or ulcers. The former may pervade the whole surface, being first noticed on the forehead about the root of the hair; the latter show themselves in the first instance, generally, on the external genitals; but when they appear as secondary symptoms, the fauces are often affected. They may extend either into the vagina or urethra. In the absence of proper evidence, it is difficult, whatever may be said to the contrary, to determine whether an ulcer be really syphilitic or not. Sores thought to be of this nature are supposed to be characterized by being deep, with thick, hard, red edges, indurated base, rough surface, covered with pale yellow, or dark grey pus, and extending, or cicatrizing slowly. When the system is much contaminated, the individual may fall a victim to it in a few days or weeks after parturition. In most syphilitic subjects, the fœtus is expelled some time in the sixth or seventh month, rarely previous to the earlier of these periods.

As to the management of such cases, the practitioner is rarely aware of the condition of the patient until after delivery; but when he is, mercury in moderate doses should be exhibited; and its judicious use will arrest the progress of the disease, preserve the fœtus, and prevent premature uterine ac-

tion. When the constitution is deeply contaminated, nothing can save such a subject after parturition, but the regular exhibition of mercury. The blue pill produces as little, if not less irritation, than any other preparation of this mineral. Four grains of this mass, with half a grain of opium to prevent diarrhœa, should be given night and morning; and to bring the system the more speedily under the influence of the medicine, Unguent. Hyd., is to be rubbed equally often, on each thigh alternately. To prevent unpleasant disclosures, a female so situated should nurse her own child, whose treatment will be considered in another part of the work. It is impossible to say how long or to what extent this medicine should be continued; this is a point which should be left to the judgment of the practitioner. It is sufficient to push it the length of causing gentle tenderness of the gums, and in most cases of continuing it for three weeks after every vestige of the disease has disappeared. In such cases it is most difficult completely to eradicate the virus, which may show itself repeatedly in some form or other, after it has, to all appearance, been effectually removed.

As there are many cases published, and several instances known to the author, where the practitioner, while lending his aid during parturition ,was contaminated with syphilis, this should suggest to persons engaged in midwifery practice, the propriety of having their fingers at all times properly imbued with unctuous matter, while at the bed-side.

Sect. XXVI.—*Spasms of the Stomach and Bowels.*

These may be considered dangerous, but they are fortunately of rare occurrence. The irritability of the system predisposes to them. They may arise from exposure to cold; beverages containing carbonic acid, as brisk beer or porter; indigestible aliment; torpid bowels; and violent mental emotions. When the stomach is their seat, they are preceded by a feeling of cold without actual rigors, depression of spirits, and a gnawing sensation in the epigastric region. These ailments may continue for several hours before a sense of the most painful contractions, squeezing, or drawing together of the organ, is felt by the patient. The spasms are also preceded by frequent yawning and stretching, shrinking of the features, pallid countenance, restlessness; and until the stomach is affected, the individual is unable to refer her complaints to any particular part. Warm liquids afford temporary relief, but the stomach rejects every thing. When the disease has continued for some time, the

pulse becomes frequent, irregular, small, or contracted. It is distinguished from gastritis by there being perfect and long intervals of relief, by the pulse continuing long unaffected, and there being no nausea or vomiting, except when liquids are swallowed; whereas in gastritis the pulse is rapid from an early period, and the pain and nausea or vomiting, are almost incessant.

In spasms of the bowels, there is no obvious precursor; the uneasiness, which is limited to the umbilicus, returns by paroxysms, and is followed by the discharge of flatus, which affords relief. A sense of wringing and twisting at the navel, which is the chief feature of colic, is familiar to most people. It differs from enteritis and peritonitis in being free from vascular excitement, in the uneasiness returning by fits, and in being relieved rather than aggravated by pressure. The prognosis, particularly in spasms of the stomach, should be guarded.

As to the treatment, the sufferings of the patient may be cut short at once by a large dose of Calomel and Opium, when we are certain that the bowels are free. When the disease is the result of mental emotion, forty or fifty drops Sol. Mur. Morph. may be ordered with almost certain success. The Aq. Ammon. is also very useful. When there is reason to suspect constipation as the cause of spasm, either in the bowels or in the stomach, there is no remedy more certain and effectual, than repeatedly filling the colon with water as warm as the patient can receive it. When the stomach can retain medicine, the bowels should be cleared by Ol. Ricin.; and cold liquids should for some time be interdicted.

Sect. XXVII.—*Diarrhœa.*

This is too familiar to the profession to require either a lengthened definition, or a long history of symptoms. It consists in a succession of liquid stools. Diarrhœa simply, is a complaint of little moment; but when it is attended with an increase of temperature, and of the rate of the pulse, with diffuse uneasiness over the abdominal cavity, it should be viewed as a symptom of some more formidable derangement, very probably inflammation of some portion of the mucous tissue of the intestines. When there is no fever, however, nor continued pain in the abdomen, the patient may be speedily relieved, and ought to be so, since, by suffering her complaint to continue, her strength will be reduced, and the milk will recede, which would unfit her for the duties of nursing. The prevailing irritation, more especially of the ab-

dominal viscera after parturition, must favour this affection; and the usual exciting causes are, torpor of the bowels, exposure to cold, drinking cold liquids, surfeiting, and the mental passions.

In the treatment, the practitioner should, in the first place, make a careful inspection of the excreta, and if, from their intolerable fœtor, the admixture of indurated portions, with accompanying tenesmus, there be reason to suspect previous torpor or neglect, no relief can be expected until the bowels shall have been cleared out. The patient should be ordered an adequate dose Pulv. Rhei et Submur. Hyd. with the free use of diluents. When exposure to cold is suspected as the cause, if the excreta be not unusually fœtid, Vin. Ipecac. Vin. Antim. combined, may be ordered in moderate doses, frequently repeated, or small quantities Pulv. Ipecac. Comp. If there be tenesmus, and a sense of heat in the rectum, a most effectual remedy, after the bowels have been properly evacuated, is small doses Pulv. Ipecac. et Pulv. Rhei, combined, repeatedly in the course of the day. Cretaceous mixtures are also useful, after all offensive matters have been removed. The diet must be regulated, and be as dry as possible; boiled rice and milk, or rice gruel and milk, will be found eligible. All other vegetable matters, liquids, and unctuous substances, are to be interdicted until the bowels have resumed their healthy functions.

Sect. XXVIII.—*Typhus.*

This disease is ushered in by the same assemblage of symptoms as characterize it in other individuals, except that the rigor, generally, is not so well marked. If the patient has quitted her bed, she is observed to be languid, indisposed to exert herself, and particularly inclined to sit by the fire. After being harassed for one or more days by these feelings, a headache is complained of, which at first is limited to the forehead and eye-balls. Another early symptom is disinclination to food, or nausea, succeeded by shrinking of the features, furred tongue, urgent thirst, parched skin, pain in the large joints and along the spine, and a dry cough. The pulse is about 120. Sometimes the first symptom to create suspicion is listlessness: the patient is indisposed to answer questions; and the eye is destitute of animation. At other times the attention of the attendants is arrested by the individual frequently yawning and stretching. The tongue is not always furred; sometimes it is entirely of a fiery red colour. There is slight tumidity of the abdomen, with ardor

urinæ. The urine is not always high coloured; sometimes it is pale, but cloudy; at other times it has a brownish appearance. The author has not known the disease commence before the fifth day from the time of delivery, nor continue for a longer space than fifteen days from the appearance of fever; and he has seen it cease on the seventh. In every instance he has met with, its cessation was preceded by profuse perspiration. The milk recedes, but the lochia experience little alteration. I have never seen the disease among females in the higher walks of life, but invariably among those residing in the areas, lanes, and ill-ventilated narrow streets of the town; which induces me to ascribe it to the influence of a foul over-heated atmosphere, want of cleanliness, and damp. It is much milder in the puerperal state. than under other circumstances.

The treatment differs little from what is required when typhus appears in non-puerperal patients. Except in stout vigorous subjects, who are rarely affected, the author never found it necessary to use more powerful depleting measures than the application of leeches to the temples, and the use of purgative medicines every alternate day, such as Senna, Neutral Salts, and Compound Jalap. Effervescing draughts are very grateful to the patient, and gently tend to move the bowels. The body ought to be sponged with tepid water daily, and the bed and body linen changed as often as circumstances will permit. The excreta, as quickly as they are voided, should be removed from the apartment, which ought always, when the individual is awake, to be freely ventilated. Bland vegetable nourishment should be ordered for support, and every idea of nursing relinquished.

Sect. XXIX.—*Structure of the Mamma.*

These organs are composed of cellular membrane, adipose matter, and numerous conglomerate glands. The cellular tissue is endowed with great elasticity, as is proved by the extent to which the breasts may be distended. The glands are conical, and separated from each other by the adipose matter of which the mammæ are partly composed. When a woman enters on the duty of nursing, the numerous minute excretory ducts sent off from the glandular part of the organs unite to form larger ones. These extend to the areola of the mamma, where they become a little contracted, and thereafter pass to the extremity of the nipple, where they terminate by open mouths, sufficiently large, in some instances, to be distinguished by the eye, in proof of which,

when their contents are copious, they permit it to escape, either in large drops, or an uninterrupted stream. The *areola*, so called, is a brown circle, surmounted by the papilla or nipple. Numerous little tubercles, or warty eminences, are implanted over the surface of the nipple. This appendage is also abundantly furnished with sebaceous glands, which, in the healthy state, furnish a secretion to defend it from the effects of friction, when it is embraced by the child's lips. The mammæ are numerously supplied with blood-vessels, lymphatics, and nerves, all of which become greatly enlarged, when the breasts are called upon to perform their function, which is to secrete nourishment for the young of our race. Febrile excitement generally precedes the first appearance of the secretion; and when once formed, titillation, or suction, causes it to flow from its canals. The mammæ, while in a state of excitement, as during the formation of the milk, are more liable to take on diseased action, than when the function for which they are destined, is not in operation. The derangement may be functional or structural. Under the first head may be considered, superabundance, diminution, unusual fluidity, and unusual viscidity of the secretion; and under the second may be included, excoriation, inflammation, and suppuration of the organs.

Sect. XXX.—*Superabundance of Milk.*

We judge of the quantity of the secretion, by the size of its reservoirs, the freedom with which they discharge it, the extent to which the infant seems satisfied when the teat is withdrawn, and the influence of such a constant drain on the health of the parent. If the child should seem satisfied when the breast is taken from him, and appears to thrive, while the health of the mother is not suffering, we are justified in concluding, however plentiful or scanty the secretion, that it is merely in a just ratio with the wants of the child, and the powers of the parent. When the patient, however, is suffering from debility, and the infant from the effects of surfeiting or want, we may then consider the secretion preternatural, or insufficient in quantity, when steps must be adopted to remedy the condition of the nurse. Superabundant flow is generally connected with over excitement of the secreting organs. A sedentary occupation, and torpid bowels *predispose* to it; and the principal *exciting cause* is indulgence in nourishment, more especially in rich soups, or other nutritious fluids. The injurious consequences likely to arise from this state of the secretion, are not limited to the

nurse alone, but may also extend their influence to the child. In the former, they may lead to marasmus; and in those predisposed, to melancholia, and phthisis; in the child it may produce convulsions, or fever, from disordered bowels.

In the treatment, the primary object is to diminish the secretion, by the regulation of diet, and by exercise. Soups are to be interdicted; and liquids of every description to a greater extent than what may be barely sufficient to effect the passage of the more solid food. Boiled meat, properly cooked, should be preferred to roast. When thirst is complained of, the subacid fruits, as they do not much increase the quantity of the circulating fluids, while they gently act on the bowels, are proper. The whole body should be but lightly covered, so as to repress excitement. Saline purgatives, and foot exercise, are to be indulged in.

Sect. XXXI.—*Deficiency of Milk.*

The secretion may not only be deficient in primary confinements, from a variety of causes, but sometimes altogether absent, especially in females who are well advanced in life; in them, this may be ascribed to the organs being but imperfectly developed, and not having been earlier called upon to perform their functions. Defective secretion may also arise from emaciation, general debility, over-exertion, want, or improper nourishment, night watching, uterine irritation from over-excitement or disease of the organ, excessive evacuations by stool or perspiration, protracted and preternatural flow of the lochia, the abuse of spirituous liquors, high seasoned food, passions of the mind, repeated attacks of ephemera, and the return of the catamenia. In females who have become matrons when very young, the milk is often deficient; as it is frequently also in those who are strongly stamped with the characteristics of struma. Certain states of the mouth of the infant may conduce to diminish the secretion, as hare-lip, cleft-palate, and bound-tongue. Weakness of the child may favour the retrocession of the milk, by the nipple not being drawn with sufficient power.

In the treatment, much may be accomplished by avoiding the exciting causes; but over some of these, as privately indulging in stimulating cordials, and excess in venery, the practitioner has no control; some of them also can only be remedied by a surgical operation. When, as in young females, the secreting organs are prematurely called into action, as also where individuals have not become matrons until a late period of life, and are deficient in milk, frictions with dry flan-

nels over the surface of the breasts, constantly covering them with warm clothing, by augmenting the current of fluids towards them, will tend to increase the secretion. Where it is diminished in consequence of profuse perspiration, lochial discharge, or diarrhœa, the proper steps are to be adopted to check these complaints. The apartment of the nurse should be properly ventilated, and moderate exercise in the open air inculcated. When emaciation or general debility seem to be the cause of diminished secretion, a liberal diet must be recommended, with some mild cordial, as Porter or White Wine. The proper regulation of diet cannot fail to accomplish much in every case; the nourishment should be chiefly of a vegetable nature, since it has been proved by experiment, that this kind of regimen will generate more milk than animal food; and except in the description of cases particularized, no cordials should be allowed. Moderately rich soups free from spice, are proper; and boiled, is preferable to roast meat. To prevent corpulency, which is unfavourable to a healthy, plentiful secretion, the nurse, when the infant does not require her attention, should be employed in any manner in which she can make herself useful. When the causes are of such a delicate nature that the woman herself cannot be spoken to on the subject, the sick nurse, or some female friend must be commissioned to make known our sentiments.

Sect. XXXII.—*Unusual Tenuity of the Milk.*

This, or watery milk, as it is vulgarly styled, may be ascribed to derangement of the digestive, or some fault in the secreting organs. Among the poor of a large city, this condition of the milk is most frequently observed; and it may originate from sloth, indolence, and unwholesome food. The most certain method of determining the quality of the secretion is either by observing its effects on the infant, or by a microscopic examination of the fluid, when it will be remarked, that in milk of this character, the oil-like globules are in extremely small quantity. When unfit for the child's nourishment, the eyes become gummy and delicate, the face pale and emaciated, the breath sour, the urine copious, and the stools are either of a muddy colour, or green as grass, and the infant is tortured with gripes.

In the treatment, the condition of the general system must be improved, and the diet regulated. Since tenuity of the secretion is generally attended with impaired digestive organs, some tonic must be prescribed; when there is debility, a proportion of Wine or Porter allowed, and a country

residence recommended. The patient must be ordered a generous diet, with rich soups and animal jellies. Calomel as an alterative, to the extent of exciting tenderness of the gums, has often produced a salutary effect both on the secretion of the parent, and on the health of the infant.

Sect. XXXIII.—*Viscid Milk.*

This condition of the milk is caused by its containing colostrum in large quantity:* it has already been stated, that this matter generally disappears from the milk two or three days after delivery; in some instances, however, it continues much longer, and has been seen several weeks after that event,—the secretion is then unusually thick, and the infant suffers from disorder of the stomach and bowels. Digestion is ill performed, breath fœtid, milk loathed, the child has frequent attacks of colic, its excreta are thin and of a greenish appearance, there is emaciation, and a perpetual disposition to sleep. In some instances the body of the child is covered with a papular eruption. The condition of the secretion is to be corrected by a vegetable diet, and a liberal allowance of demulcent drinks, as barley water and gruel. In all the conditions of the milk which have been described, the practitioner is to be regulated in his interference by its influence on the general health of the child and parent.

Sect. XXXIV.—*Marasmus.*

By this is meant general emaciation. At first the patient complains of pain and a sense of weakness in the lumbar spine, which last incapacitates her from remaining for any length of time in a standing position; and from this cause also, she is unable to hold the body perfectly erect. During the day, there is excessive languor and frequent yawning; and at night, restlessness. The countenance is sallow, there is great thirst, and disinclination to exertion. As the evening approaches, the hands and feet become warm, and the pulse accelerated. In the morning, the patient complains of headache, thirst, tenderness, and a sensation as if there were sand in the eyes, with dimness of sight, and at last ophthalmia. There is total loss of appetite, actual loathing of solids, but great inclination for fluids. In cases of long standing, there is breathlessness, cough, and torpor of the bowels. The urine is inconstant in colour, discharged frequently, and in small quantity.

* Vid. p. 152.

An irritable disposition of the system, general debility, and deficiency of milk, are to be viewed as affording a predisposition to it. Among the exciting causes, we may enumerate excessive evacuations, want of nourishment, unwholesome food, and loss of tone of the digestive organs. Marasmus is often observed among those females who persist in giving suck when the secretion is not sufficiently copious. Permitting the child to sleep with the nipple in his mouth during the night, by keeping up a drain from the system, is a frequent cause; as also night-watching. A nurse may be affected with marasmus from her sustenance being insufficient, or without nourishment, yet she may possess abundance of milk. This is a fact which may often be observed among females in the humbler spheres of life, who, from their limited circumstances, are compelled to subsist on articles which furnish but little nourishment. And, though such ingesta do not afford sufficient support for themselves, yet they rear much stouter children on the milk generated by such materials, than those mothers who are enabled to partake of all the luxuries of high life; a proof, if any were needed, that indulgence in cordials is not necessary for a nurse. As to loss of tone of the digestive organs, if their functions be so much impaired that the aliment is not properly assimilated, or converted into nutritious matter for the support of the system under its losses from a variety of causes, it is obvious that emaciation must follow. The prognosis must be guarded, for if the patient persist in nursing, mania or phthisis may supervene.

In the treatment we must be guided by the particular exciting cause. When a woman is deficient in the supply of milk from the first, as occasionally happens in females in the upper walks of life after a primary labour, she should be directed to observe regular hours for rest and nourishment, relinquish visiting and nocturnal entertainments, indulge in a liberal proportion of vegetables for diet, rich soups, and the moderate use of some mild cordial. The infant should be early accustomed to artificial nourishment, that the duty of nursing may prove less onerous to the parent. When emaciation is gaining ground in despite of these measures, the mother must be recommended to procure an assistant nurse. Where excessive evacuations by the skin, bowels, or uterus, or suffering the infant to sleep with the nipple in his mouth, have conduced to marasmus, the mode of relief is obvious. From what may be daily observed among the poor, who are frequently exposed to hunger, we may conclude that deficient nourishment, except in cases of actual want, is rarely the

cause of marasmus. The most frequent circumstance connected with diet, liable to give rise to this morbid state, is the undue use of stimuli. When impaired digestive organs seem to give rise to it, a country residence and tonics are to be recommended; but when this course is not adequate to the recovery of health, nursing must be relinquished, lest phthisis or mania be superinduced.

Sect. XXXV.—*Excoriation and Ulceration of the Nipples.*

These are conditions of rather frequent occurrence in nurses, and too often the source of great torture. The nipples may be affected independently of any disease of the mammæ; but inflammation may commence in either set of organs and extend to the other. Excoriations, and ultimately ulceration, may take place in the papilla, in consequence of a variety of causes connected with nursing, as the frequent application of the child to the sensitive nipple. It is a mistaken notion among the sex, and there are not wanting members of the profession who agree with them in thinking, that some remedy should be applied to the nipple to fortify it before the individual begins nursing. Numerous astringent remedies have been resorted to for accomplishing this object: the result too often is, the induction of morbid action in the glands of the organ, whereby their secretion is suppressed or vitiated; and the terminal extremities of the lactiferous ducts contracted. These changes are followed by accumulation and mechanical distension of the mammary canals; hence inflammation of their extremities, and hence also pain and distension of the breasts. From the apertures of the milk ducts being contracted, a stronger effort is required on the part of the infant to procure their contents, whereby inflammation of the nipple is hurried on. Excoriations may form in this appendage, in consequence of its being exposed to the air, and to friction by the clothes while the skin is imbued with milk.

These affections are among the most exquisitely painful complaints of nurses. They frequently lead to extensive mammary abscesses; and the sufferings to which they give rise on applying the infant, are incredibly severe. In the generality of cases, the morbid condition of the nipple is limited to excoriations or chops; but occasionally the whole of the appendage is consumed by ulceration. Its forcible elongation by various expedients, when it does not project sufficiently to enable the infant to grasp it, is a fertile source of inflammation and its consequences.

In remedying these painful affections, we must first pre-

pare the papillæ, previous to parturition, for the better performance of their functions; and, secondly, adopt the proper means for the removal of these affections after they have appeared. Under the first head it will be necessary to consider the mode of rectifying the nipple when it does not sufficiently project to enable the infant to embrace it. The safest plan is to have it drawn once in six hours, either by an adult or an old child. This operation should be resorted to before the infant is applied. Mechanical inventions have been contrived to answer the same object; and the most effectual is a brass machine, which acts upon the principle of the air-pump: Its use should be commenced for several weeks before delivery. There are also machines by glass-blowers to answer the same object. Instead of the unscientific practice of attempting to harden the nipple, something must be used to soften it, to promote the action of its glands, and render the lactiferous ducts more permeable. This object will be accomplished by simply rubbing on the nipple and summit of the breast, night and morning, for several weeks before delivery, a little olive oil.

For nipples in a state of ulceration, or affected with excoriation or chops, numerous remedies are recommended. A compress, immersed in a concentrated decoction of Cicuta, or of Digitalis, or in a solution of a drachm of Opium in an ounce of water, will be found beneficial, constantly applied, when the infant is not sucking; or dressing the excoriated part with a liniment, composed of one ounce of Lard, and one drachm of Opium; or instead of the Opium, the same proportion of the sedative solution of this drug. But the same application should not be continued beyond a week, for, when long applied it ceases to have any influence. Some contrivance must at the same time be used, which will enable the infant to procure the secretion without exerting the pressure of its lips on the papilla. This is effected by fixing on a wooden shield, which is placed on the summit of the breast, an artificial nipple, made either of elastic gum, or doe-skin; or the teat of a cow may be used; but the other contrivances are not only more cleanly, but fully as useful. If the nipples be the seat of ulceration, there is no alternative for the time, but to relinquish nursing. When the excessive pain arising from excoriations or chops, has become less acute, there are a variety of astringent remedies which may be used with advantage; but as, when some time continued, they lose their influence, none of them should be used longer than a week. One part Aq. Litharg. Acet. and four parts of Cream; Ox. Zinci ʒj. et Adip. Suill. ℥j.; or two drachms Litharg., the

same quantity of Acetous Acid, and six of Olive Oil, rubbed together, until they assume the colour and consistence of cream, may all be found useful.

Sect. XXXVI.—*Inflammation of the Mammæ.*

This is not generally met with for one or more weeks after delivery. In some cases it is an extension of the affection last considered. Females who have formerly had a mammary abscess, are liable to be again equally unfortunate. The premature use of stimuli and rich food, exposure to cold, and repeated attacks of ephemera, are the usual exciting causes. The most frequent termination of these cases, is suppuration; the author has seen but one instance in which grangrene ensued, the symptoms were so alarming, that he was afraid lest the patient might not survive them; a great proportion of the breast sloughed away.

The excitement may be limited to one or two of the superficial glands, and such cases are mild; or it may extend to those that are deep-seated, and prove far more troublesome. These latter cases are preceded by rigors, and accompanied by a smart attack of symptomatic fever. The affected breast becomes unusually warm, tense, and at last discoloured; and subjacent to the discoloration, considerable hardness is felt. In four or five days, the affected organ is so tumefied, as to equal the size of three or four in the healthy state. The formation of matter is known by the diminution of pain, indistinct rigors, and an œdematous state of the diseased breast, recognised by pitting on pressure. The contents of the abscess, which are often enormous, are discharged by a small opening, and cicatrization gradually takes place, after a protracted oozing of thin fluid. In other instances, extensive sloughing follows; but the ulcer is superficial, and closes sooner than could be looked for.

When the suppurative process is speedy, cicatrization is equally so; but when the formation of pus is slow, the ulcer which results from the bursting of the abscess heals tardily, is apt to become ill conditioned, and to discharge fœtid matter; the whole mammary plexus becomes enlarged; several glands suppurate in succession; deep-seated sinuses form, which prove exceedingly troublesome; and the patient becomes emaciated from long confinement, and profuse discharges of pus.

The general treatment of cases of this nature, must be strictly antiphlogistic. At one period, some diversity of opinion existed as to the local applications; while such reme-

dies as were supposed to possess the power of repelling excitement, as cold saturnine applications, were insisted on by some, others recommended a plan diametrically opposite. When a practitioner is early called to a vigorous patient, one smart detraction of blood should be premised; leeches in considerable numbers applied to the diseased breast; and the bowels cleared out by a full dose of some saline cathartic. The patient should remain in bed, and have the organ supported; and when the leeches have dropped off, the whole breast should be covered by a warm emollient cataplasm. Warm applications are now very generally preferred to cold, and deservedly so, for they are not only more effectual in diminishing pain, but also more congenial to the feelings of the patient. Moreover, they support a continual exhalation from the diseased organ, which is favourable to the removal of excitement. Cold applications, independently of their being less efficacious than the warm, are not altogether free from danger. They have been observed to give rise to indurations and callosities, which have been known to lay the foundation for scirrhus, especially upon the application of some severe irritation, as repeated attacks of inflammation of the organ, and blows or other injuries. In regard to warm fomentations, it must be remembered, that when they are used, we cannot predict whether they will have the effect of bringing about resolution or suppuration, for sometimes the one, and sometimes the other happens; but the earlier the warm applications are resorted to, the more likely we are to prevent the formation of matter. And instead of drawing these organs, as is too often practised, with a view to diminish the irritation consequent on the accumulation of milk, this plan should be interdicted as highly injurious, and the tension relieved by fomentations, abstinence in fluids, and free purgation. When the excitement is subdued, or nearly so, it is proper to draw the organs, to encourage the return of the milk.

Should abscess form, in despite of the practice which has been described, the cataplasms are to be continued until matter can be distinguished, when it must have exit by the lancet. Pus should always be suffered to come near the surface, before we attempt to open the abscess; for, by pushing an instrument several inches into the substance of the breast, the matter is apt to collect at the bottom of the wound, burrow in the substance of the organ, and give rise to sinuses. For the first few days the sore should be dressed with Resinous Ointment, and a cataplasm placed over the dressing. When the pain ceases, simple ointment, and a compress im-

mersed in one part of proof spirit, and three of water, to discourage the discharge when profuse, are to be applied. Where indurations remain, the mammary plexus becomes enlarged, and the sore generates unhealthy pus; the breast should then be covered with a Cicuta cataplasm, Submur. Hyd. given as an alterative, and tonics, with a country residence recommended. A cataplasm of decayed fruit, as pears or apples, may often be advantageously alternated with the Cicuta, and more especially when this last occasions nausea, as generally happens. To remove indurations, frictions with Unguent Hyd. are useful. When the cicatrization of an abscess has taken place, the nurse must be enjoined to make an effort to restore the milk; for it is a prevailing notion among the sex, that the function of the breast will necessarily cease after suppuration.

CHAPTER II.

DISEASES IN THE UNIMPREGNATED STATE.

In this chapter will be considered such diseases only as are incidental to the sex, and will be noticed in succession as they affect the superficial and deep-seated external genitals, the urinary canal, and, finally, the more important organs of reproduction in the pelvis.

Sect. I.—*Inflammation of the Labia.*

In consequence of the delicate structure of the lining membrane of these organs, excoriation of it is not unfrequently met with, from exposure to cold, the friction of the clothes, an acrid condition of the fluids, and inattention to cleanliness. It is simply an inflammation of the investing membrane. It may be affected in consequence of impure connection; but we have then regular ulcers, which are somewhat deep, with thick red edges, hard base, rough surface, lined with pus, which inclines to a yellow or grey colour, and extend or cicatrize slowly. Easy, however, as it may seem in books, to distinguish syphilis, it is far otherwise in practice; and its removal by mercury does not establish its syphilitic origin, since the exhibition of this medicine is also beneficial in sores of a more simple nature. It is of the utmost importance, in all doubtful cases, for the practitioner to deliver his opinion in such a manner as shall

not disturb domestic harmony: where the nature of the disease is even obvious, it might be proper to call it by the name of some affection which is known to be benefited by this drug.

Abscesses may form at any period of life in the cellular structure of these organs, in consequence of various injuries, but occasionally without our being able to trace any cause. In two cases under the care of the author, the inflammation was ascribed to the parts having been accidentally kicked by children during sleep. It is recognised by acute, throbbing pain, induration, and circumscribed swelling.

Phagedenic inflammation, as it is styled, may affect the labium. The part which is to become its seat, first appears reddish, inclining to lividity, followed quickly by vesication, and ulceration, which is rapid in its progress, is attended with pain and fever, and generates a large quantity of pus. Sometimes the ulcer is superficial, at other times deep-seated.

In treating excoriations, much may be accomplished by dress, cleanliness, and the regulation of diet. The patient should wear light clothing, use tepid ablutions of a diluted solution of the Sulphate of Zinc, Alum, or Copper, and be restricted to spare diet. Sometimes the surfaces of both labia appear as if vesicated; and they are apt to cohere, a circumstance which must be communicated to the sufferer, that a piece of lint, dressed with simple ointment, may be insinuated into the vagina. To prevent contact, the patient, while in bed, should have a pillow between the knees. The bowels should be gently moved every alternate day, by the Super. Tart. Potas., Pulv. Jalap. C. When the case does not yield to the foregoing local remedies, a solution of the Nitrate of Silver must be tried.

In phlegmonous inflammation pus rapidly forms, the abscess soon bursts, and cicatrization speedily follows,—no other remedies being necessary during these processes than a warm emollient cataplasm, and ablutions with tepid water.

In the phagedenic variety, stimulating local applications answer best. When there is much constitutional irritation, if the patient can support it, a moderate detraction of blood must be premised; the part fomented by poppy-heads, when the disease is attended with much pain, and the ulcer dressed with Unguent. Ox. Hyd. Rub. Mit. This latter application, however, must be rendered of such strength as a due observation on its effects shall point out; the Carrot, Fermenting, or Cicuta Cataplasm, alternated with each other, have often been attended with marked benefit. The bowels are to be kept moderately free by mild laxatives, rest observ-

ed, and when there is much pain, a powerful dose Sol. Mur. Morph. ordered. The free ventilation of the apartment must be observed. Where other remedies seemed to possess little influence in arresting the progress of the ulcer, or in accelerating cicatrization, mercury has succeeded; and in all cases where syphilis is suspected, this medicine must always have a judicious trial. To prevent an increase of the sufferings of the patient, from the urine flowing over parts in a state of excitement, the catheter must be constantly retained in the urethra.

Sect. II.—*Prurigo.*

The pudendum is occasionally the seat of an affection somewhat analogous to the prurigo scroti in the other sex. It attacks the entrance of the vagina as well as the labia, and is attended with a feeling of tension in these parts, and sometimes with inflamed itching. From this latter sensation being incessant and intolerable, inconceivable distress arises; and venereal sensations take place, which are an additional source of suffering to the individual. Sometimes, though rarely, ulceration and dreadful sloughing follow; but aphthæ on the labia, nymphæ, and along the vagina, are frequent. There is, from the passages, an increased secretion of a viscid consistence, and very offensive odour. This affection is occasionally met with in the early months of pregnancy, and it is then also that ulceration is apt to take place. The itching is sometimes so insupportable as to prevent the patient mixing in society. At times the disease, apparently, is unconnected with any other morbid state; while in other instances, it is evidently symptomatic of ascarides, hæmorrhoids, and scirrhus uteri. Inattention to cleanliness, and an acrid condition of the fluids, may give rise to it. Females advanced in years, and those of a relaxed habit, oftener suffer from it than individuals under opposite circumstances. It may be viewed as a variety of subacute inflammation. Idiopathic cases are most difficult of removal; the symptomatic less so. Occasionally pruritus has been connected with the development of an unusual quantity of hair on the external genitals.

In the treatment it is of the first consequence to prescribe some remedy which will subdue the itching without the use of frictions by the fingers, a remedy which is certain of aggravating the disease. A Solution of Hydrocyanic Acid in water, used as an ablution, is highly recommended; the author has found Solutions of the Muriate of Mercury and of the Nitrate of Silver, efficacious remedies. With these local

applications, the internal exhibition of Cicuta, in powder or extract, will be attended with advantage. Sometimes a species of vermin are generated, in which cases the margins of the labia have a vesicated appearance; and the most efficacious remedy is ablution of the parts with a strong infusion of Tobacco. When it seems to arise from superabundance of hair, a depilatory ointment composed of two parts of quick-lime, and six of lard, rubbed on the organs twice daily, has, in a short time, effected a cure. In the more troublesome varieties of pruritus, an abstemious vegetable diet, and an alterative course of saline aperients, and in plethoric persons the abstraction of blood, with the most scrupulous attention to personal cleanliness, must be conjoined.

Sect. III.—*Verrucæ or Warts.*

These are sometimes developed on the external genitals in great numbers; they are supplied with nourishment by the superficial vessels. Their connection to the surface is by a broad base, or a narrow pedicle. In their texture, they are either soft or horny; the former, when they grow from parts which exhale freely. When soft, they are exceedingly sensible to the slightest irritation. Though at times the causes of warts be obvious, yet in other cases we are unable to account for them. From parts which are constantly covered with moisture, as under the prepuce in males, at the termination of the rectum in both sexes, and on the inner surface of the labia in the female, it is well known that warts grow from want of cleanliness, acting by the induction of chronic inflammation. Debility and disorganization of parts favour their development, for they often show themselves on points which have long been the seat of inflammation. They frequently grow on surfaces which at some former period had been the seat of syphilis.

In their removal, whatever remedy be employed, it should be such an agent as will effect this expeditiously, for long continued irritation has sometimes led to unpleasant consequences. The soft wart may be got rid of expeditiously, by repeatedly washing it daily with a composition of one part of Pyroligneous Acid, and three of water. For the horny production, the knife should be used; and when the irritation thence induced has subsided, the radix of the excrescence should be sprinkled with some of the Pulv. Sabin. A concentrated solution Muriat. Ammon. is useful in eradicating warts. When a syphilitic taint is suspected, a moderate course of mercury should be recommended.

Sect. IV.—*Aneurismal Dilatation.*

Such a state of the arteries ramified on either labium, may take place, and cause these organs to become tumefied. Swellings of this nature are to be distinguished from herniæ, by their increase being gradual; their size being permanent and irreducible; and conveying to the fingers a feeling of fluctuation. They are not actually painful, but give rise to a sensation of tension; neither does their size increase by coughing. When the nature of the case is certain, the aneurismal blood should have exit by a free incision; and, if necessary, the hæmorrhage can be moderated by stuffing the vagina.

Sect. V.—*Aqueous Stillicidium from the Labia.*

An oozing of this nature is furnished by the interstices of numerous morbid prominences, which rise from two lines to the third of an inch from, and above the surface of the integuments that cover the labia. It is most apt to appear in those of a shattered constitution, females advanced in life, such as have had a numerous family, and persons of a corpulent habit. The exudation is in a ratio with the extent of the disease; it is attended almost constantly with some degree of pruritus, and the continual drain ultimately debilitates the patient. It is of such rare occurrence, that the author has never met with an example of it. Except the excision of the diseased organs, all other remedies have proved unavailing; and this has only been tried in one instance,* at the earnest solicitation of the patient. The internal use of bark has been resorted to by Sir Charles Clarke, and the local application of a powder composed of finely levigated Sulphate of Copper and Starch. Cold water has been found, by the same writer, a valuable remedy; and several others of the ordinary astringents have had various degrees of success.

Sect. VI.—*Elongation of the Nymphæ.*

This condition of the external genitals is a subject of which the exact origin is still a matter of dispute. While Vaillant, Moreau de la Sarthe, and Barrow, ascribe it to the labia pudendi, other authorities equally respectable, as Cuvier, Sommerville, Lawrence, insist, that it originates from the *alæ minores.* It is met with only in a race of native females at the Cape of Good Hope, styled Bosjesmen, and does not exist in the Hottentots generally: indeed it would seem, from

* Sir Charles Clarke on the Diseases of Females, vol. ii. p. 127.

the observation of travellers, that when intermarriages take place betwixt these nations, this peculiarity gradually disappears. The female progeny of a European father and a Bosjesmen mother does not possess it. In the infants of this people, the elongation is just apparent, and gradually increases in length with age. We are ignorant of the cause of its formation, for it does not appear to be the result of forcible extension. But as it is said to be almost impossible to have connection with these women without their consent, and even assistance, this apron has been thought to be furnished to afford them protection against violence from the other sex. It consists of a fleshy substance whose colour has been variously described; and it descends to the extent of three or four inches from the external parts, in the form of two pendulous lapels of a triangular figure.

These elongations will appear the less remarkable, when we consider that the nymphæ, with which they are more immediately connected, are sometimes of an inconvenient length, even in females of this country; but more especially in the Moors, Copts, and women of colour, among whom circumcision was at one period practised, as is noticed by Pliny. In May 1843, the author excised these organs in an unmarried female of 17, in whom, when she had been long in the erect posture, each would acquire the size of a child's hand. When they project beyond the labia, they occasion much inconvenience and uneasiness, during walking, sitting, or the act of sexual congress; and sooner or later they become the seat of troublesome excoriations. Relief is easily obtained by the knife or scissors, but we cannot, unfortunately, dispense with an indelicate exposure. As the organs are very vascular, hæmorrhage is to be guarded against by stuffing the vagina.

Sect. VII.—*Elongation of the Clitoris.*

This organ sometimes increases so much in thickness and length, as to resemble the membrum virile. Fabricius, Pallas, Bartholinus, Saviard, and others, relate instances in which it measured from one to several inches in length. Haller observes, that in such of the sex as are addicted to sexual libertinage, this organ increases in size, an opinion satisfactorily disproved by Duchatelet. Some women have been so bountifully endowed in this respect as to be enabled to gratify the passions of their own sex. In the works of every Frenchman who has written on female diseases, mention is made of this disgraceful practice, which would seem to be so familiar to the people of that country, that it became necessary to in-

vent a term for it: the noun *Tribade* is applied to those who have a lustful desire after their own sex. In persons addicted to it, marasmus, retention of the catamenia, and even idiocy, have been the consequences. From the clitoris contributing perhaps the greatest share of the gratification which the female experiences during coition, it has been proposed, in order to subdue this inclination, to extirpate the organ; and Ætius, in no very delicate terms, describes the mode of performing the operation in virgins who had this part of preternatural length. It has been recently resorted to in this country with success, in a young female, for the cure of onanism.* Ætius cautions the practitioner against cutting too near the pubes, lest permanent incontinence of urine might follow; but this is not a constant result, as the author very lately witnessed the complete removal of the clitoris, without any unpleasant consequence.

The organ may be enlarged by disease independently of any exuberance; or it may be the seat of cancer, and require removal. When it is affected with cancer, it becomes tumefied, painful, and indurated; the glands of the groins are enlarged; there is irritability of the bladder and rectum; and the secretion from the vagina is increased. Sooner or later ulceration takes place, and thereafter fungous growths from When operations of this nature are required, it is scarcely necessary to state, that the utmost privacy should be observed in performing them. As the vascularity of the organ is naturally considerable, and as this is increased by disease, the practitioner should be prepared against hæmorrhage.

Sect. VIII.—*Imperviousness of the Hymen.*

Imperforation is the only condition of this septum which requires the interference of a practitioner, but occasionally a preternatural membrane is found anterior to the valvula vaginæ. The natural is generally placed within the preternatural septum, which, in some instances, not only closes up the vagina, but has also in the fœtus been found reflected over the meatus urinarius. This ought to be remembered, lest we should be informed that the infant had not voided urine within a reasonable period after birth. Imperforate hymen, or foreign membrane, may become a serious obstacle to the performance of some of the most important functions; for independently of its proving a barrier to sexual intercourse, it may cause an accumulation of the menses in the vagina, and by occa-

* Med. Chir. Rev. 1825, p. 558.

sioning tumefaction of the abdomen lead to injurious suspicions regarding the private character of the individual, as well as to severe disturbance in the whole system. When the elaboration of the catamenia commences, their accumulation in the vagina causes, at each period, most excruciating pain of an expulsive nature in the lower part of the abdomen, pelvic cavity, and sacrum. The perinæum and anus at last become distended as in a woman in labour; and if an examination be made per vaginam, the preternatural septum, or the hymen, is felt like a protrusion of the membranes of the ovum in the early stage of a first labour. There is difficulty in voiding urine, and œdema of the lower extremities.

Generally, the hymen, as formerly observed, is so constituted as neither to prevent the appearance of the catamenia, nor oppose the consummation of marriage. When present at the first intercourse, and ruptured, an effusion of blood takes place, which, by the Jews, is considered as a test of virginity. But as this production is sometimes entire when labour comes on, while it is occasionally wanting in children, it is obvious that its absence cannot be considered as proof of an act of incontinence, nor its presence as one of chastity.

The quantity of menstrual fluid which has been known to accumulate in the vagina in consequence of imperforate hymen is almost incredible. On the authority of Benevoli, a case is related, in which, on puncturing the septum, thirty-two pints escaped. The passage may be rendered pervious either by a trocar and canula, or a lancet. In one of two cases which occurred to the author, the operation became necessary a second time, precisely a month after it was first done, from the divided margins of the membrane having cohered. To prevent cohesion, therefore, a wax taper or candle should be introduced and retained in the vagina, until the discharge has ceased; and during the same period, ablution with tepid water should be repeatedly practised each day.

Sect. IX.—*Malformations of the Vagina.*

These are, contraction at a particular point, or of the whole canal; occlusion of a portion; shortness; its total absence; and its termination in the rectum or bladder; and in some instances, its formation into a double passage. Narrowness of the vagina may either be the work of nature or of art. Females have been born with it too contracted to receive even a common pencil case. In the young female descendants of royalty, of the Eboe nation in Africa, it is customary, about the time the catamenia are expected, to

stitch the external orifice, to prevent illicit connection. The contraction may be the result of previous inflammation, ulceration, or injury during labour. When the canal is impervious, this may be owing to a membranous production superficially situated, or to a fleshy septum more deeply seated. Its length, in some instances, has been found not to exceed one or two inches. In case of contraction, its capacity may be enlarged, if necessary, by the introduction of tents, or wax tapers gradually increased in size. When there is complete occlusion, there is nothing which a practitioner should be more anxious to remove; since, if such a state be allowed to continue, it must prove an insurmountable barrier to the performance of the more important functions for which the uterus is destined. If the obstruction be superficial, it may be easily remedied as recommended in the last section; but if it be deep-seated, an attempt to rectify the defect cannot be free from risk. When there is no appearance of the catamenia at the usual period, and when the individual is not suffering from their retention, there ought to be no interference with a cutting instrument, even though the exploration of the canal should disclose an obstruction. But if from periodical expulsive pains, an accumulation in the pelvis, difficult micturition, constipation, and gradual enlargement of the abdomen, there be evidence that the catamenia are secreted, we are to perforate the obstruction, by the aid of a speculum and a bistoury. A gum tube should afterwards be introduced to preserve the passage free.

Where a patient has conceived, we have little to fear for the result, as the passage is usually dilated by the efforts of labour; but when it is not, the particular circumstances of the case will suggest the proper line of practice.

Sect. X.—*Watery Tumour of the Perinæum.*

This part sometimes becomes infiltrated, owing to the gravitation of water from the abdomen into the pelvis, betwixt the rectum and vagina. The accumulation is occasionally so great, as to interfere with the evacuation of the bladder. It is distinguished from hernia by the invariable presence of fluctuation, its appearing transparent when a candle is held on the opposite side, and the tumefaction diminishing on the patient betaking herself to the recumbent posture. If it arise from dropsy, the same treatment will suffice; and the tumour, for the removal of its contents, must be pierced by a proper instrument.

Sect. XI.—*Inversion of the Vagina.*

A tumefaction from infiltration, and consequent protrusion of the mucous lining of this canal, has erroneously been so styled. It is seldom encountered except in elderly individuals. Every circumstance calculated to induce general relaxation, predisposes to it; but especially frequent child-bearing, protracted leucorrhœal discharges, and undue indulgence in the hip warm-bath. In the commencement, the descent of something like a circular portion of the canal is felt, and in the centre of this, nearer the os externum than usual, the os uteri. When the malady is farther advanced, an oval, smooth, soft, and indolent swelling, which is not much influenced by any position which the patient may assume, except when she has long been in the erect posture, presents at the vulva. In complete prolapsus, the mucous membrane never entirely recedes spontaneously into the vagina, even when favoured by position. The patient now complains of deranged digestive functions, pain in the back, a sense of weight in the pelvis, tenesmus, and difficulty in voiding urine, in consequence of some change in the situation of the rectum and bladder. As the swelling is now extra vulvam, it is exposed to the friction of the clothes, and washed by the urine; and hence troublesome excoriations, followed, in some instances, by more extensive inflammation, and the destruction of the part.

As prolapsus of the vagina, and the same condition of the uterus, have some symptoms in common, the difference must be stated. In displacement of the sexual canal, the swelling is soft, never recedes, while the aperture in its centre is sufficiently large to receive one or two fingers: in prolapsus uteri, the tumour is firm, and recedes by change of position; the aperture is too contracted to admit the summit of one finger, and it is more regular and resisting than that in displacement of the vagina.

The treatment must vary according to the stage of the disease. When there is no protrusion, the hip cold-bath repeatedly each day, the occasional injection of from four to six ounces of a tepid concentrated decoction of oak bark, into the vagina, indulgence in the recumbent posture, and regulating the bowels by enemata, will effect a cure. In cases of actual protrusion, the egg-shaped pessary, and a spring bandage resembling that employed for prolapsus ani, must be recommended. The excision of the protruded portion of the tunic is sometimes required to induce the re-

mainder to contract; but the removal of the whole circle is neither safe nor necessary.

Sect. XII.—*Leucorrhœa.*

When the exhalation from the vagina is preternatural, or flows from the canal, this is the term used. It is met with under two forms—the acute and chronic, which last is very frequent. The cause of this affection may be referred to two heads; *first*, such as act immediately on the parts affected; and, *secondly*, such as exert their influence indirectly. Leucorrhœa may appear under two conditions of the organs; *first*, a state of acute; and, *secondly*, of chronic inflammation. To the first class of causes belong sexual libertinage, exposure either to intense heat or cold, abortion, frequent child-bearing, the presence of a pessary, or descent of the uterus. In the second class, or such as influence the part affected indirectly, we may particularize the mental passions, the undue use of cordials, an impaired state of the stomach, alimentary canal, and chylopoietic viscera, ascarides in the rectum, and sloth. Another state which is often attended with this complaint, is diminution, or suppression of the catamenia. In this instance some deny, while others assert, that the disease is an effort of nature to supply the place of the menses; and the circumstance of its disappearing on their re-establishment, seems to support the latter opinion. In some instances, especially of plethoric females, though the monthly indispositions be in the natural proportion, yet their recurrence is preceded, and their cessation followed, by profuse leucorrhœa. The organs just particularized must act upon the genital system, through the medium of the nerves; for betwixt the stomach more especially, and the uterus, the sympathy is powerful. It may be inferred also, that particular states of the nerves arising from that portion of the medulla spinalis included in the sacrum, may excite leucorrhœa; but it must be confessed, that the operation of this cause is not very obvious; and that some of the phenomena attendant on this disease, as pain in the back increased on pressure, and inability to stand erect, may be consequences as well as causes. General debility has been viewed as an exciting cause; but there is none less frequently concerned; and both this and plethora ought rather to be considered as conditions which predispose to the disease. Among those who are most liable to it, we may specify individuals of a strumous habit of body, persons residing in damp, ill ventilated situations, such as lead an inactive life, and those

who are inattentive to personal cleanliness. Except in cases of extreme debility, this affection is almost always connected with excitement from organic disease; or inflammation simply, of the parts affected.

Many are of opinion that the uterus alone is the source of the discharge; but it is occasionally so profuse, that we cannot possibly admit this idea; and it is certain indeed, not only that it is not limited to the uterus, nor even to the vagina, but that it extends into the urethra, and at last affects the inner surface of the bladder itself.

When the uterus is affected, the uneasiness is at first confined to that organ. It is more acute, sensibly increased by the pressure of the finger against the cervix, or by the evacuation of the rectum. Marked constitutional disturbance may attend a severe attack of this nature, as rigors, nausea, headache, and accelerated pulse. By Sir C. M. Clarke this has been designated the *white discharge;* the cervix, in his opinion, being the part principally affected.

When the bladder is involved, there is frequent desire to void urine, pain in attempting it, frothiness of the secretion when received into an utensil; and the urethra, when traced with the finger, feels painful and obviously thickened. In the first instance, most probably the discharge is furnished principally by the vagina, and in some degree by the uterus, being elaborated by their lacunæ and glands.

It commences with slight pruritus, followed by a sense of fulness in the pelvis, uneasiness in the vagina, and pain in the lumbar and sacral divisions of the spine. Sometimes there are venereal sensations, with frequent desire to void urine. Occasionally the labia are swelled, the canal itself feels contracted, and the inguinal glands slightly enlarged; and after three or four days, an unusual flow from the vagina succeeds, varying in quantity and colour. At first it is sparing, but it continues to increase for a few days, until it amounts to a profuse flow. It may consist of mucus simply, or it may appear white, green, or more opaque, and yellow or purulent. The pelvic uneasiness is now greatly relieved.

The chronic variety is generally a sequence of the acute, and is characterised by the absence of pain, except a sense of gnawing in the sacrum, and invariably attended by derangement of the digestive organs, occasionally palpitations, and œdema of the ankles. When it appears in persons of shattered constitution, there is tenderness of the eye-lids, constant languor, pale, sallow, emaciated features, indifference to the caresses of the other sex, sterility in most cases when the uterus is affected, great susceptibility to atmospheric

changes, sometimes mental debility; but rarely constitutional disturbance, either in this or in the acute variety.

A nice and important practical point, but one by no means easily determined, is the mode of distinguishing between leucorrhœa and gonorrhœa. And what increases the difficulty is, that the former is sometimes so acrid, as to occasion in males who may have had connection with such females, excoriations around the glans penis, and even a discharge from the urethra. Every practitioner must have heard of cases, where much domestic unhappiness has arisen under circumstances of this nature. Leucorrhœa is never almost attended with so much pain at any time, as gonorrhœa; it does not begin so early, increase in severity, nor continue by any means so long, as when it is the result of impure connection, while, moreover, the inguinal glands are much more frequently enlarged from this last cause. According to Ricord, in 8 out of 12 cases, the urethra and bladder are affected in gonorrhœa; and in every nineteen of twenty instances, the external surface of the vaginal portion of the cervix uteri is covered with ulcerations. The former of Ricord's statements is denied by Cullerier, Blatin, and Nivet. The history, habits, and moral character of the patient will often assist us in arriving at a proper diagnosis.

The *prognosis*, in a decidedly scrofulous habit, should be unfavourable; for with such a predisposition, the discharge may persist for a series of years, under the most exact regimen, and in despite of every remedy. When it has been excited, and long supported by mental passions, it is obstinate; as also, when it is connected with over-indulgence in cordials: all chronic cases are more difficult of cure than the acute. Leucorrhœa supervening to abortion, is often troublesome of removal. When the disease depends on a plethoric habit of body, is evidently attended with symptoms of excitement, and when the exciting cause is local, without organic lesion, the case is more easily remedied. And it may now be stated, once for all, that in affections of the passages, no opinion should be hazarded, no remedy prescribed, without previous exploration; since there are many cases in which, even after actual examination, it might be difficult to pronounce the cause of the disease; and since great injury has too often arisen, from persons prescribing from the mere report of a patient.

Our *treatment* must depend on the variety of the disease, and the nature of the exciting cause; and our success will be in a ratio with the extent to which this last can be obviated or removed; on all occasions therefore, a proper discrimina-

tion of its nature, whether local or general, is of the last importance towards improving the condition of the patient, or affording permanent and effectual relief. We must also carefully observe whether the disease be chronic or acute, and connected with a state of activity or debility of the system.

In a woman of full, vigorous habit, no practice in the way of depletion can be more judicious than the application of leeches to the uterus, groins, vulva, or to the anus; general blood-letting is rarely necessary. In the event of their being pain in the sacrum, indicating some morbid state of the portion of the medulla therein included, the greatest benefit will be derived from the implantation of cupping glasses or leeches upon that region; and the application of the latter to the os or cervix, when these are in a state of disease, will be of the first utility. It is almost incredible how small a portion of either of these, in a state of excitement, is capable of producing a copious flow from the passages; and hence the necessity of the most careful examination. Blisters upon the sacrum or perinæum, have proved highly beneficial in chronic cases, connected with diseased action of the nerves of the parts involved. The diet should be abstemious, and chiefly vegetable; liquids used sparingly, and the *mildest laxatives.* Exercise on foot in dry weather, is proper; but over-fatigue, damp, and cold are to be avoided. When the disease is connected with plethora, nothing stronger than the frequent use of tepid water as an injection should be permitted.

When leucorrhœa is dependent on debility, whether local or general, an opposite plan of practice must be pursued. We place our chief reliance on the internal use and local application of tonics. The warm aromatic medicines, as Colombo, Ginger, and Canella Alba, seem to answer fully better than Quinine. If they are given in wine, Port should have the preference. Moderate exercise in a dry open situation, warm clothing, and a generous diet, as free from slops as possible, are highly proper. The tepid bath, as a general remedy, is one which will be found very beneficial; but as the system acquires vigour, the water should progressively be used cold.

A great many local remedies have been much lauded in this affection, but the author is satisfied that there are but few of them which deserve the encomiums that have been bestowed on them. Of late years much has been said of Sol. Nitrat. Argent. for the cure of leucorrhœa, but it does not appear to be possessed of greater virtues than many other remedies better known to the profession. The greatest cau-

tion ought to be observed in the use of powerfully irritating and astringent injections, such as those containing Nitras. Argent., Murias. Hyd., and Sulph. Alum., vel Cupri, for if there be a tendency to scirrhus uteri, they are certain of hurrying it on. The Nitras. Argent. in its crude state, cautiously applied to ulcers on the cervix, os uteri, or in the course of the vagina, is an invaluable remedy; but of the indiscriminate injection of solutions of this powerful agent, the author cannot approve. The vegetable astringents are perfectly safe, not less efficacious, should be used in a tepid state, and the one employed changed for some new one, whenever its advantages are not apparent. A decoction of Oak Bark, an infusion of Galls, of the Anthem. Nobil., and a tepid watery solution of Kino or of Catechu, are proper. Whatever remedy be employed, it will fall short of accomplishing the object in view, unless ablution of the passages be *frequently* practised; and on this account, the repeated use of the cold hip-bath daily, with the precaution subsequently, of using frictions with a dry towel, over the sacrum and perinæum, will be found most salutary. In chronic cases, the tepid salt water, or sulphureous hip-bath, and the internal use of the Sulph. Potas. cum Sulph., have proved beneficial. Though the condition of the bowels is not to be overlooked, mild aperients, however, except in vigorous plethoric subjects, are to be preferred. Small doses Fol. Sen. with a slight addition Sulph. Magnes., Pulv. Rhei, vel Ipecac., and the domestic enema, answer every purpose.

Besides the remedies now enumerated, many others have been extolled as possessing some specific power on the part affected; but to speak from his own experience, the author is disposed to believe that those practitioners who would candidly disclose the result of their practice, would confess that they had been too frequently useless, if not hurtful. The most popular of these medicines are, Bals. Copaib., Pip. Cubeb., Tinc. Cantharid., given by the mouth, and various preparations of Iron and Mercury, together with the use of Iodine in different forms. The author has been informed by Dr Thatcher, an eminent, and the oldest obstetric physician in this city, that the most inveterate chronic examples often yield to a combination of equal parts Tinc. Mel. Ves. et Tinc. Mur. Fer., the former prepared with double the quantity of Flies, directed by the Edinburgh Pharmacopœia.

Sect. XIII.—*Excessive Irritability of the Os Externum.*

In noticing this condition, the object of the author is more to direct the attention of his brethren to, and elicit their sentiments regarding the management of, a set of cases in which he has himself failed to benefit those who consulted him, than to communicate much information of his own. He has been applied to by the partner of one of his brethren, the lady of a military officer, and by another female in respectable circumstances. The first and third of these individuals were examined *per vaginam et rectum*, and except excessive irritability, and a consequent very contracted state of both apertures, there was nothing elicited; and the intrusion of the index finger into either passage was attended with excessive suffering: the second individual would not submit to an examination. None of the three experienced any uneasiness during the evacuation of the rectum; and all of them were unaware of their condition, until the first attempt to consummate the marriage compact, which, as well as every subsequent endeavour to cohabit, has been the source of so much torture, that sexual congress has been altogether suspended, while one of the parties contemplated a legal separation. Those individuals had not conceived when the author was consulted, though two of them had been several years married.

Leeches were applied to the *os externum* and to the *anus*, and the dilatation of the former aperture attempted by the usual means, without advantage. Since his opinion has been asked in the foregoing cases, a fourth has occurred, of which the particulars have been communicated to him. In this instance several members of the profession had been consulted, and all the usual means employed, without benefit, until application was made to a veteran and distinguished obstetric physician, whose name the author is not at liberty to mention, and who completely relieved the patient by a surgical operation. The os externum was extended in a lateral direction to as great a degree as the structures could support, by means of lithotomy forceps, when the part was divided about the centre of one side of the orifice, towards the tuberosity of the ischium, to within a safe distance of the pudic artery. After the cicatrization of the wound, the patient could submit to sexual congress without any inconvenience.

Sect. XIV.—*Excrescences in the Urethra.*

These give rise to much suffering when the urine is voided. The pain extends along the spine, and in females of an irritable habit, is so severe and pungent, as to occasion a feeling of tremor, or in some instances, actual convulsions, while the monthly indisposition is either attended with much uneasiness, or is very copious. The feelings of the patient are sometimes not aggravated by the sexual intercourse, but in other instances they are rendered excruciating, and the act is followed by an effusion of blood. Generally the growth is so near the meatus that it may be felt or seen; it is vascular, and exceedingly sensible to the touch, but not firmly fixed. At other times, the excrescence is more deeply lodged in the passage; and we suspect its presence by the symptoms; but which, for some time at first, may be mistaken for those produced by a calculus. In cases of doubt, the canal must be explored, and foreign bodies lodged therein displayed, by a gradually dilating speculum. These growths, like warts, may arise from chronic inflammation: they may easily be removed by scissors or the knife, which should be preferred to the ligature, as being productive of less irritation. The catheter must be introduced, and retained until the tenderness arising from the excision of the tumour subsides. The removal of the excrescence is sometimes followed by so great a degree of irritation, as to require leeches to be applied to the vulva: the use of the bougie in such cases, invariably, almost, alleviates the sufferings of the patient; and it is highly beneficial even in cases where the pain in the urethra does not arise from this cause.

Sect. XV.—*Inversion of the Urethra.*

This may be partial or complete, and form a swelling at the superior part of the fossa navicularis; it is rarely met with except in elderly females. We are often at a loss to assign a cause for it. In some instances it is certainly induced by tenesmus of the bladder, from some source of irritation. In trivial inversion, a bougie must be kept in the canal; but when present to a greater extent, the protrusion must be excised, and the instrument mentioned, thereafter introduced.

Sect. XVI.—*Varices of the Urethra.*

This consists in a thickening and congestion of the structures of the urethra, followed by consequent contraction of its calibre, with painful and difficult micturition. The introduction of a finger into the vagina discovers an unusually incrassated, corded, and tender state of the canal. As the complaint is rarely met with except in females who have had a family, it may be presumed that preternatural and frequent distension, with consequent atony of the parts, lays a foundation for it.

Among the symptoms, the first to command attention is frequent desire for micturition, attended by incessant uneasiness, a flow of mucus from the canal, and pain during sexual congress. These ailments lead to an investigation, when the conditions of the urethra already described are at once cognizable. According to Dr Churchill, the canal presents a dark red colour, forms at a particular point a pouch traceable by the catheter, and lodging a little urine, is the cause of the frequent desire to evacuate the bladder. From the result of my own experience, though I have not been consulted in many cases, I am of opinion that it will rarely be necessary to expose the parts for the purpose of diagnosis, as the complaint is readily recognized by the ordinary examination.

The best *treatment* is puncturing, or the application of leeches to, the distended vessels, to make compression on them by the introduction into the urethra of a very large bougie, and to distend the os externum moderately, by rags immersed in some astringent solution, as that of Sulph. Alum., Sulph. Zinc., Acet. Plumb. The indelicate exposure is the only objection to puncturing the varices; but this plan is decidedly the most expeditious and effective. Blistering the perinæum has failed in two instances under my care. Until cicatrization has taken place, the patient should withdraw from active exercise, and pass the greater part of her time recumbent on a sofa.

Sect. XVII.—*Malformation and Deficiency of the Internal Genitals.*

Some of these organs may be wanting altogether, or malformed; but few of these defects are discoverable during life. Sometimes the uterus is larger, at other times smaller, than usual; and in some instances where it was found in the

latter condition, such females were known to have had sparing menstruation. The womb is occasionally wanting, but at times it appears as if double; or its cavity is divided by a septum; and we sometimes find the vagina similarly formed. When the uterus is apparently double, it has never been found with twice the usual number of tubes and ovaries. Cases have been met with where it appeared as a shapeless mass, without any cavity, ossified, or so solid as to resist the blow of a hammer. Littre and Morgagni have found stony concretions imbedded in this organ, and the author has a preparation of this nature. The latter writer relates a case of imperforate uterus. The Fallopian tubes have been found obstructed, and the ovaries wanting. Morgagni relates an example of the latter description. The author was consulted in the case of a lady, whom, from her having never had the catamenia, while she was known to be a total stranger to the softer passions, and to be perfectly regardless of the attentions of the other sex, he was led to consider the subject of some important sexual defect. She died at the age of forty, of phthisis; and until within a few years of that event, always enjoyed excellent health. She was of a tall inelegant stature, and had always a keen appetite.

Sect. XVIII.—*Infecundity.*

This subject may be divided into *inability* and *sterility*. When the formation of the organs is such as to prevent the consummation of marriage, by opposing the entrance of the membrum virile into the vagina, or the access of the semen into the deeper recesses of the genital system, the term inability is not inappropriate. An individual may be considered to labour under sterility, when, in consequence of some particular state of the system perhaps unknown to us, she does not conceive, though the act of copulation be performed in all respects as in those who bear children, and though she be in the enjoyment of perfect health. From the foregoing explanations, it is obvious, that sterility may be temporary or permanent, remediable or not.

The *temporary or remediable* causes are occlusion or narrowness of the vagina. These defects may have been connate, or be the result of art, or inflammation. When they are superficial, they may be remedied by the knife, or by the introduction of sponge tents, or wax tapers. These cases do not always require the aid of a practitioner; for, in many instances where the passage is so contracted that it is difficult to determine whether it be at all pervious or not, impregnation

takes place, and the vagina is dilated by the parturient efforts. For the mode of rectifying these defects, Section IX. of this Chapter may be consulted. An individual may be rendered temporarily or permanently barren, both by functional and structural derangements. Under the former head, leucorrhœa occasionally, the various diseased conditions of the catamenia, excessive irritability of the os externum, and nymphomania, may be placed. Infecundity may be owing to irritation of the organs, arising from too frequent sexual intercourse, as in prostitutes. Scirrhus, or cancer, dropsy of the uterus, with prolapsus, and polypus of the organ, may be mentioned under the head of structural defects. It is proper to be aware, however, that scirrhus or cancer, except when the womb is extensively involved, does not always prevent impregnation.

All diseases which debilitate the general, but more especially the genital system, with the exception of some pulmonary affections, and in an especial manner phthisis, may occasion temporary barrenness. Some females have been known to pass from ten to twenty years without being impregnated, though in constant intercourse with the other sex. A temporary suspension of the procreative function is not unusual in females who have suffered much in child-bed, or from one or repeated abortions. The author attended a woman who, at nineteen, produced a still-born child, after a very severe and protracted labour: she continued barren twenty-one years, her second child being born in her forty-first year. The cases are numerous, indeed, of sterility succeeding one or repeated abortions, or premature labour. When a woman marries at an advanced age, she is not so likely to be impregnated as one who enters the matrimonial life at an earlier period; for, in the former case, the organs are daily becoming less active; while, in the latter, although there may be temporary barrenness, yet as the organs will continue to a certain period of life to increase in vigour, the individual, at a future period, becomes productive. History furnishes some very interesting examples of the latter description, as that of Catherine de Medicis, the Queen of Henry the Second of France, who was ten years married before she conceived, but afterwards had a numerous family; and the case of Anne of Austria is not less remarkable, for she produced Lous XIV. after a sterility of twenty years.* Great corpulency in either sex seems to induce an inaptitude to procreate, owing probably to the generative organs being influ-

* Mauriceau, Obs. 192, vol. ii. p. 153.

enced by the diminished energy induced by this adipose cachexy. From many observations, I am satisfied that the undue use of ardent spirits, and contamination by gonorrhœa, may lead to infecundity. The want of mutual affection in consequence of some physical infirmity may be a cause of unproductiveness. A lady is well known to the author, who has the misfortune to be united to a husband who, during seminal emission, loses all control over the sphincter ani; this lady has never conceived, although all her sisters have a family.

Sterility would, in some instances, seem to be owing to a want of affinity, or agreement of the dispositions or temperaments of the sexes, as may be presumed from some persons, though unfruitful, possessing, nevertheless, all those apparent endowments which are considered necessary to secure a progeny, and from each of the individuals, on associating with other partners, engendering a family. A naval officer with whom the author was intimate, married in the *vigour of life* a young lady of great personal attractions; and a short time thereafter, in consequence of his being ordered on service, a separation of *several years' duration* was the consequence. The lady continued unproductive; nor did she conceive after the return of her husband, though they enjoyed each other's society for several months. The same cause as formerly led to a second separation for something less than a year; and at the time there was no evidence of impregnation. Shortly after the departure of her husband she placed herself under the protection of another officer, and soon afterwards she conceived. A reconciliation, some time thereafter, took place betwixt herself and her husband, to whom she made amends for her delinquency by subsequently *presenting him with a numerous progeny.* These latter examples, as well as those in which females have conceived after a long period of suspended procreative function should suggest to practitioners more than ordinary caution in their decisions, when consulted by persons anxious for a divorce, upon the supposition of either party being unfruitful. A willing ear should never be lent to a measure so momentous, except when there is decided evidence that the cause of sterility is irremediable, and was present antecedently to marriage.

Among the causes by which an individual may be rendered permanently barren, we may particularize absence and imperforation of the uterus, the organ when present having no cavity, imperviousness of its tubes, dropsy, cancer, and deficiency of the ovaries or of their ovula. All these conditions are irremediable, and, with the exception of the absence of the uterus, the existence of the others may remain

concealed for life. There is no well attested case recorded of an individual conceiving, in whom the catamenia had not appeared; and where the contrary is assumed, there must have been a discharge from the womb, though of a different aspect from blood.

Independently of the directions that have been offered for remedying cases of which the causes are obvious, a variety of plans have been resorted to with various degrees of success, for patients in whom the causes are obscure or wholly unknown, as a particular regimen, a mild Course of Mercury, the use of the Sulphureous Springs, Galvanism, Electricity, change of Climate, and a temporary separation of the party.

The influence of a diet consisting of fish, by the numerous progeny of families residing in villages on the sea coast, whose nourishment is chiefly derived from this source, has always been too remarkable to escape observation. The author has been informed by one of his brethren of three cases of individual females in respectable life, who had been sterile for several years after marriage, but who became productive under the influence of a diet of animal food.

On the authority of Mauriceau we have the case of a lady who had been sterile twelve years, during the latter three of which, in consequence of some protracted disease that had reduced her to a state of extreme debility, she was recommended to try the celebrated aperient and tonic waters of Vichy, which proved an efficient remedy; for after two visits, —the one in the spring, and the other during the autumn of the same year, she improved so very greatly in her health, that in four months she became pregnant, and afterwards had a numerous family.

It is a well established fact, that a change from a rather cold to a more congenial climate, has exerted a most beneficial influence on the reproductive function. Many instances have been communicated to the author, of females who had either been barren or had ceased to bear children in Britain, becoming productive after a short residence in New South Wales. In Europe, even, we find that females who inhabit dry, elevated, and exposed localities, are not so productive as those of the sex who reside in districts which are sheltered, and enjoy a more congenial temperature.* The author was intimately acquainted with a respectable female, who three times conceived during different voyages to Surinam, while with her husband, who was commander and owner of a vessel which traded to that colony.

* Fodéré, Pathologie et Médecine Légale de la Stérilité.

Sect. XIX.—*Nymphomania.*

This term implies an uncontrollable desire for venery. It may commence from a period considerably antecedent to puberty, to the decline of life; but the young are more frequently affected than the aged,* widows than those living in connubial intercourse, persons endowed with great mobility of the nervous system, than the phlegmatic, and women of colour, and such as reside under the torrid zone, than females of a white population, or such as inhabit temperate climates. A sanguineous temperament, an ardent state of the passions, and a neglect of the more important points of female education, with laxity of morals on the part of those by whom the sufferer has been surrounded in early life, are obvious predisposing causes. Among the exciting, we may mention a residence in warm countries, or in large towns, where many objects daily present themselves to excite the passions; early and frequent introduction to public entertainments; high living; the abuse of cordials; great irritation of the genital organs; and the retrocession of cutaneous eruptions. Unusual enlargement of the clitoris, and malpractices resembling onanism, have been particularized as causes; but from the inquiries of Duchatelet, the former does not appear to be at all influential, as persons with enlargement of the clitoris are not always lascivious.

Languor, a disposition to retirement, and unusual pruritus of the external genitals, are among the precursors of this distressing affection. Its existence is not easily ascertained in the incipient stage, for the delicacy so natural to the sex constrains their inclinations, and induces them to conceal with care their unfortunate condition, until the passion becomes so imperious as to set all decorum and restraint at defiance. *Three distinct stages* may be marked. In the first, the sufferer is merely observed to be pensive, to sigh frequently, dart libidinous glances, to have restless nights, dyspepsia, with slight febrile excitement: there yet remains firmness of mind sufficient to resist the immoral inclinations which now begin to torment her. As the supernatural passion gains the ascendancy, however, the melancholic or pensive disposition of the first stage gives way to a state of much excitement, which ushers in the second.

In the *second stage* we have a wanton, incessantly rolling

* In the lunatic asylum at Vienna one of the authors saw, in the summer of 1841, three individuals with this disease, whose respective ages were 72, 74, and 86 years.

eye, frequent sighing, flushed countenance, and heaving of the breast, while the individual, by her libidinous actions, automatic movements, and language, openly declares the perverted state of her inclinations. Too frequently masturbation is resorted to in private, not so much from lasciviousness as with a view to relieve her distressing sensations. But when the second stage is at its acme, so far from making any attempt to restrain the current of their sentiments, such females have, on the contrary, been known, even in the presence of strangers, to use the most obscene expressions, and to exhibit the most libidinous attitudes and gestures. If the external genitals are examined, they are often observed to be of a florid aspect and excoriated, and to furnish a fœtid discharge; and if the sufferer be interrogated as to the origin of these appearances, she has less reluctance to have them imputed to impure and illicit connection, than to the frequent application of the hand, which is the principal cause.

The *third stage* is, at length, marked by total alienation of mind, and entire disregard of all moral conduct. The unhappy victim sometimes imagines herself in the society of the other sex, whom she calls upon, and addresses as if they were actually present. So perverted is reason, and so violent the passion in the advanced stage, that the sufferer, when complacent glances, artifice, solicitation, and even bribes, have all failed, has been known to menace the other sex to comply with her wishes. Buffon relates the case of a young person of twelve, who, perfectly regardless of any number of spectators, would proceed in the most unceremonious manner, and by the most obscene actions, to satisfy her passion. The author was well acquainted with a family of rank, of whom a young member had been repeatedly detected with a youth of the lower orders, who had been idiotical from birth; and when the latter was punished for using improper liberties with his betters, he pleaded in excuse, that the young lady had enticed him to the act, by giving him sums of money.

The disease is rarely fatal except when elderly persons are its victims, who become exhausted in consequence of the perpetual pollutions which are resorted to with a view to quench the internal flame. It is much less obstinate in young subjects, unless connected with organic disease. Sometimes it disappears spontaneously, and it is then attended by some critical evacuation, as a copious leucorrhœal discharge, uterine effusion of blood, profuse evacuations by stool or urine, or a cutaneous eruption.

The symptoms, pathology, and the method of treatment which has proved most successful, all seem to point out that

the disease originates in the organs of reproduction. In some instances the clitoris, in others the uterus, in a third the tubes, and in a fourth the ovaries, have presented various morbid changes. The clitoris has been found much enlarged, the uterus increased in size and the seat of excrescences, the ovaries swelled and dropsical, and the tubes loaded and enlarged to the volume of a pease pod. In some instances, as happened in the case of a young married lady of great personal attractions, for whom the author has lately been consulted, neither the external genitals, nor the uterus, as far as these organs are susceptible of ocular demonstration, presented any unusual appearance. Indulgence in sexual intercourse has, in many instances, been followed by the removal of the disease. By all writers who have devoted much attention to the subject, cases are related in which it was suspended when the individual became pregnant, but it generally re-appeared after delivery.

As to the treatment, so far from thinking indulgence in the passions the chief remedial agent in all cases, there are examples in which it might be useless, if not highly injurious. When, for instance, the disease seems to arise from practices in the female, resembling onanism in the male, it would betray no great judgment to recommend connubial enjoyment as a remedy, since, in its influence, it so nearly resembles the exciting cause. The organs of reproduction, both external and internal, should, as a preliminary step, be made the subject of careful examination. When these are the seat of inflammation in any form, or of any morbid lesion, their relief must be the first object of the practitioner. The antiphlogistic regimen in all its points, except general blood-letting, must be rigidly persevered in. This latter remedy, however, even in stout plethoric individuals, is to be resorted to with caution; and when there is complete alienation of mind, it must be altogether avoided. Where, however, from a loaded condition of the ocular vessels, and vertigo, we have evidence of congestion of the centre of the nervous system, one or two cupping glasses on the back of the neck, and the head shaved, are most suitable measures. When the organs, external or internal, seem the seat of excitement, no practice can be more judicious than the copious local abstraction of blood by a number of leeches; ablution of the vagina, by an infusion of Tobacco, strong decoction of Cicuta, or a weak solution of Prussic Acid, should be practised repeatedly each day; and the internal use of some of these drugs, as Pulv. Cicut., and Vin. Tabac.; also Tart. Antim. in nauseating doses, should be conjoined. Should

the clitoris, from its volume or otherwise, appear the seat of irritation, there should be no hesitation in suggesting its removal where other means have failed. Every thing which is calculated to inflame either the body or mind, should be interdicted. On no occasion ought the patient to be left alone; her hands should be secured while at rest, and no more bed-clothes allowed than what are barely sufficient to prevent shivering. The improvement of the mind should form a principal feature in the treatment; and the benefit which has arisen from sexual intercourse should be communicated to the relatives, with a view to a matrimonial alliance being permitted, where the sufferer is known to entertain a predilection for one of the other sex. When this latter advice cannot be followed, owing to disparity in rank or other reasonable causes, much may be accomplished by stratagem. The friends may cause a report to be circulated, that the favourite has been suddenly cut off by disease; which information may be followed by such gloom and despondency as to occasion some great change in the moral condition of the sufferer, and be succeeded by so solemn a train of ideas as shall give a shock to the violence of the malady.

Sect. XX.—*Retention and Suppression of the Menses.*

These functional derangements, sometimes also styled emansio, and suppressio mensium, will be considered under one head; for the causes, symptoms, and ultimate effects of both are so nearly alike, that they could not be separately discussed without much tautology. When the menses do not appear at the usual period of life, the case is styled one of retention; and when this function is regularly established, but has discontinued, we term the derangement, suppression of the menses. Females who are reared in large towns, are more liable to these varieties of functional disturbance, than those who are brought up in the country; and they are oftener observed among individuals who can trace their descent to a phthisical ancestry, or who are themselves consumptive, and among young females originally of feeble stamina, than in persons otherwise situated. The appearance of the uterine secretion under its natural form, is a certain demonstration of the healthy condition of the organs of reproduction, and of their having attained to full maturity; whatever, therefore, that state of the body may be, which can tend to diminish the energy of the uterine or general

system, may be considered as a predisposing cause, their influence being reciprocal and powerful.

The predisposing condition may be general or local. The general cause may be debility of the whole system; and the local, diminished energy of the organs of reproduction alone. Such a variety of causes may conduce to general debility, that it will suffice merely to particularise a few of them by way of illustration. Occupation in the impure atmosphere of damp ill ventilated houses, warerooms, and factories, in the areas and lanes of large towns, is a cause of daily observation. To the list may be added, general diseases occurring at the age of puberty, unwholesome food, a sedentary occupation, and the depressing passions. As to the local causes, the energy of the reproductive organs may be diminished by over-indulgence in sexual intercourse, or certain immoral practices resembling it, and lesions of remote parts. How often is the appearance of the catamenia retarded by disease of the lungs, liver, or some other viscus either in the thoracic or abdominal cavities; while in their turn, functional derangements of the uterine system induce morbid changes in these organs. Females strongly stamped with the characters of struma, are often among the sufferers from this variety of functional derangement. The catamenia may have commenced in the most natural manner as to time, quantity, and appearance, and continue for a certain period perfectly regular, but they may be diminished in quantity, or entirely obstructed by the influence of any of the foregoing causes, or by others supervening, either during the presence or absence of the secretion.

The exciting causes of suppression are numerous, and may be referred to two heads, viz., those which are owing to moral causes, and such as arise from physical circumstances. Of these, some may act suddenly, others slowly. Among the former, we may particularise all the mental passions, as fear and joy, grief and anger. Baudelocque states, that at the time of the massacre which happened on the plains of Grenelle, during the French revolution, he had been called to sixty-two cases of threatened hæmorrhage or abortion, showing the influence of the depressing passions on the uterus. The effects of loud thunder are well known, acting, it may be presumed, upon the same principle as fear. Disappointment in a marriage settlement is not an uncommon cause. Love and jealousy, by being productive of excitement, and succeeded by diminished energy of the vital powers, are frequent causes. Young widows are often among the sufferers from this affection. All the mental

passions act through the medium of the nervous system. Some of the other causes specified, exert their influence in the first place, on the stomach, betwixt which and the uterus the sympathy is powerful and reciprocal. Of the physical causes, or those which exert a local influence, imperviousness of the vagina from imperforate hymen, preternatural membrane, or cohesion of the sides, and the congenital absence of the canal,* with closure of the os tincæ, imperviousness of the canal in the cervix uteri, the absence of this organ, or of the ovaries, may all be mentioned. Besides the great importance of the latter organs in the function of procreation, they are now admitted to exert considerable influence on the production of the menses, as is proved by the result of their absence, removal, or being affected by disease. Mr Pott's patient, whose ovaries had been accidentally removed, thereafter ceased to menstruate. Dr Churchill relates the case of a patient whose catamenia ceased for some time before her decease, and on dissection, it would seem that she had but one ovary, which was disorganized. The author was occasionally consulted, some years ago, in the case of a lady who died at the age of 30, of chronic hepatitis. She never had had catamenia, in despite of the use of every remedy to produce them, and until two or three years before her decease, she invariably enjoyed excellent health. By intimate friends she was said to be an utter stranger to the softer passions; and in her general appearance there was a mixture of those peculiarities which distinguish both sexes. Her upper lip was bearded, she had an unnatural appetite for a female, her breasts were undeveloped, she was broad across the shoulders, and contracted betwixt the innominata. There was no *post mortem* at her decease; but the author always suspected the presence of some remarkable congenital defect in the procreative system. Exposure to cold, as being of frequent and immediate influence in causing suppression, may be mentioned. Among the agents which operate slowly, may be particularized, the frequent use of the warm bath, night watching, dissipation, chronic incurable diseases, excess in venery, indolence, and occasionally, all the mental passions.

Symptoms.—In both these varieties of functional derangement, there is great disturbance of the nervous system; in

* A case of amenorrhœa from congenite absence of the vagina, or a portion of it, is related, in which the menses had been accumulating in the upper part of the canal, or perhaps the uterus itself, and when a trocar advanced between the rectum and bladder into the cyst, gave exit to the accumulated fluid, established menstruation, and restored the patient to perfect health.—*Gaz. Médicale*, Dec. 12, 1825.

almost every instance, headache is complained of; and in those who are of a plethoric habit, this symptom is distressing. There is from an early period, considerable susceptibility to impression, which, as the indisposition continues, increases to an extraordinary extent. Calling to the sufferer, for example, unexpectedly, or hastily, occasions a degree of agitation throughout her whole frame, equalled only by a shock of electricity. Some patients have incubus or frightful dreams. The mind at last yields, for the individual has an unconquerable aversion to exercise; and this disposition is certain of being followed by an aggravation of her sufferings. She shuns society and courts solitude. In both, there is great derangement of the digestive organs; but this is more remarkable in emansio, than suppressio mensium. In suppression, there is simply dyspepsia, rarely voracious, or depraved appetite; but in retention of some duration, we have an extensive train of gastric symptoms. At the commencement, there is merely dyspepsia, followed by flatulence, which is so uncomfortable in some cases, owing to the intestinal noise, as to compel the individual to withdraw from society. Sometimes again, the desire for nourishment is voracious; at other times, there is a disposition to eat articles which are not food, as cinders, lime, putty, and raw vegetables. Generally the thirst is not troublesome; in most cases the bowels are constipated, but occasionally there is a diarrhœa.

The vascular system participates in the general derangement. In emansio, acceleration of pulse is an early symptom; but in suppression, it may long remain unaffected. Other derangements of the vascular system are occasionally observed, such as hæmorrhage from different outlets, as the nose, ears, lungs, stomach, and rectum. These evacuations are vicarious, and the most frequent are hæmoptysis and hæmatemesis, which, in young females after marriage and impregnation, I have known immediately subside. Some few years ago, the author was requested to visit a female who had a periodical sanguineous exhalation from the whole tegumentary surface, which continued 3½ days. She was a person of irregular habits; had been subject to this vicarious evacuation for several years; and always, except on such occasions, enjoyed good health. Palpitations are not uncommon in cases of long standing.

The respiratory organs do not escape; from an early period there is breathlessness; and cases both of emansio and suppressio frequently terminate in phthisis; while at other times, the latter malady induces functional disturbance in

the uterine system. The liver is an organ which, more frequently than any other, experiences the influence of derangement of the catamenia, both in early and advanced life. Pain and tension in the right hypochondrium, are frequent complaints; and on dissection, the liver is sometimes found twice its natural size, of a pale yellow colour, and so friable, that it can be broken in pieces by the fingers. The spleen sometimes becomes enormously enlarged; and the kidneys even do not escape.

As to the symptoms which are more immediately referable to the procreative system, besides the mere retention or suppression, there is sometimes violent pain in the hypogastric region, more especially when the latter has been suddenly brought about by exposure to cold. Such cases are sometimes followed by hysteritis, or even peritonitis, with violent spasms of the stomach and bowels. The examination of the uterine system after death throws little light on this subject; the womb may be found smaller, and of a much firmer texture than usual; but the author has rarely had an opportunity of observing that it was increased in size; occasionally, he has seen one or two small hydatids attached to the extremity of one of the Fallopian tubes. In the advanced stages, the absorbent system becomes involved; some parts are affected with œdema, perhaps the sacral extremities, very frequently the face, sometimes the whole body; and it is not uncommon for such patients to die of dropsy. The swelling, however, differs from that of anasarca, in so far that there is little pitting except in the advanced stages, and that while it subsides on the lower extremities in the course of the night, it continues undiminished on the countenance. And lastly, the skin becomes affected; it presents a dirty yellow, or greenish hue, and hence the term green sickness; sometimes it is covered with an eruption.

Under the head of *diagnosis* there are some points which require prudent consideration. Our patient may be a young person requesting relief for obstruction, in consequence of pregnancy, in expectation, perhaps, of inducing abortion; or we may be consulted by a coquette, in whom the menses have disappeared from the period having arrived at which such a change naturally happens, but who may nevertheless be anxious to have the discharge reproduced, as a defence against old age. The one must be distinguished, to avoid our committing a serious error; and the other, to prevent our being ridiculed by the sex, for want of penetration. For the mode of distinguishing whether an individual be pregnant, the observations to be offered on that head are to be consulted.

Our prognosis in recent cases, and those apparently unattended by diseased structure, may in general be favourable; but in females of a strumous habit, in those predisposed to phthisis, and in such as have become indisposed after one or more abortions, our practice is often unsuccessful. And all cases of long standing are extremely obstinate; as also, those which have arisen from circumstances of a moral nature; since, frequently, time alone can remove the cause. Where the liver or lungs are diseased, the case is generally hopeless.

In regard to the treatment, in the *first* place, all interference should be avoided, where the retention or suppression is not accompanied with derangement of any other function; *secondly*, practitioners should avoid an error which is yet but too general, viz. directing all their remedies against the uterus, to the almost total exclusion of the general system; and in the *third* place, we are not to forget, that the organs of reproduction do not, in all females, attain maturity at the same period. In almost every periodical work of reputation, there is scarcely a number but contains an article laudatory of some specific for the removal of uterine obstruction; but there is nothing which demonstrates greater want of reflection; and those who are conversant, know full well that we possess no such agents. *The cause must always determine the treatment;* and when this cannot be ascertained, the symptoms must be attacked. Since general debility is by far the most frequent cause, one of our principal objects must be to improve the system by the use of tonics, as a country residence, exercise in the open air in proportion to the energy of the patient, who must be strictly cautioned against overexertion. She should, as much as possible, frequent entertaining society, or be accompanied by cheerful companions, who are to give such a turn to the conversation, as shall support her spirits, and prevent her brooding over innumerable apprehensions. Foot exercise is highly proper, or, if the individual think herself too weak, riding may be substituted; and if there be sufficient corporeal and mental energy, perhaps no variety of exercise will have more beneficial influence, than dancing in moderation, more especially in cases unconnected with acute affections, or structural lesion. With pure air and exercise, bathing in sea water, used at first tepid, and gradually brought to the frigid state, as the patient acquires vigour, may be usefully combined; as also frictions over the sacrum and the lower part of the abdomen. The stimulating aromatics, as Colombo, Canella Alba, and Ginger, either in substance, aqueous infusion, or in combination with Cinchona, given internally, fully equal the use of Quin-

ine. All the preparations of iron, as well as the sulphureous mineral springs, have been strongly lauded in such cases. The application of two leeches to each breast alternately every fortnight has often proved beneficial; as also a sinapism under the same regulations, in consequence of the powerful sympathy between these organs and the uterus.

The bowels demand particular attention, but they are not to be exhausted by large and reiterated doses of powerful cathartics; on the contrary, aperients are to be exhibited under the alterative form, gently to stimulate the intestines, and through their medium exert a proper influence on the uterine system. Aloetic and other Gum Resins possessing a like effect, are the most beneficial. The Aloetic Pill, with or without Assafœtida, or Colocynth, may all be given every third day, in such proportion as shall procure an extra copious dejection. Another very useful aperient is the Sulph. Potass. c. Sulph. When there is œdema of the sacral limbs, or a tendency to general dropsy, Calomel may be beneficially combined with any of the aperients mentioned. In stout plethoric subjects, purgatives may be used with greater freedom.

There is a belief, but I think it must be confined to those of our profession who have not properly examined the subject, that by acting more directly on the uterine system by sexual congress, and by medicines styled Emmenagogues, the patient might be much benefited, if not in most cases cured. Where suppression is connected with structural lesion of the lungs, liver, or any other organ, the author has had ample opportunity to convince him, that irritation arising from sexual intercourse is very injurious; and that it is equally so to excite the uterus by medicine or otherwise, when suppression has arisen from too frequent indulgence in hymeneal pleasures, or from abortion. The only examples which the author has known to be relieved by these latter means, were females of a plethoric habit, free from organic lesion, and those under similar circumstances, in whom the secretion had disappeared in consequence of moral causes. In them, Submur. Hyd. as an alterative, Tinc. Digital., preparations of Iron, and Electricity are proper; and so are also those of Iodine, of whose active emmenagogue powers I have had many proofs. I order the Tincture, commencing with seven drops three or four times daily, gradually increasing the dose. Sometimes I direct an ointment to be used, composed of Iod. ℈i, Hydriod. Pot. ʒj, Adip. Suil. ℥j, of which ʒj. is rubbed on each thigh alternately morning and evening. Of late Ergot has been recommended, and although from its

well-known influence, not only in exciting the uterus to more vigorous action during parturition, but also in moderating discharges from that organ, we could not expect it to be serviceable in amenorrhœa; we have, however, the testimony of Dr Dewees and other experienced practitioners in its favour. I rarely exhibit this drug, except to restrain discharges from the uterus, and then in doses of from ten to fifteen grains three times daily; in the form of infusion with cinnamon bark, it is both active and pleasant. More recently Strychnine has been favourably noticed by Dr Bardsley, under whose management it cured ten out of twelve cases, and relieved the other two; and also in Dr Churchill's practice, two patients recovered under its use. Iron is an agent which is often resorted to in cases of obstruction, and Dr Lococke speaks highly of a composition of its Sulphate, Myrrh, Aloes, and Savine Oil, which might be exhibited in form of pills. Cases arising from moral causes of a depressing nature, besides the means just particularized, will likewise be much benefited by travelling, and visiting places of public amusement. Camphor, in such examples, is a useful medicine. Suppression, resulting from exposure to cold during the presence of the secretion, or from the elevating passions, as violent anger, is much benefited by large doses of Opium, Ipecacuan, and Assafœtida, Pediluvium, hip warm-bath, and a soothing conciliatory conduct towards the patient. When this functional derangement arises from the sudden application of cold, severe pain in the region of the uterus frequently follows, with violent spasms of the stomach and intestines, which cases will require the vulva, hypogastric region, and groins, to be freely leeched, and enemata of warm water. When suppression supervenes to abortion, laborious labour, or immoderate indulgence in venery, the patient must be strictly interdicted every thing which has the least tendency either mental or sexual, to produce excitement, whether of the general or reproductive systems. After an abortion, or a severe labour, a copious leucorrhœal discharge supplies, in some cases, for a long time, the place of the catamenia. It should be considered vicarious, and suffered to discontinue *per se*, which will happen when the proper secretion reappears.

Cases complicated with diseased lungs or liver, are very obstinate. In the latter, there is much apathy, disinclination to the least exertion, either corporeal or mental, and unless the patient can be prevailed upon to exchange this state of indolence for one of more activity, and indulge in exercise in the open air, the case may terminate in hectic,

dropsy, or phthisis. With gentle exercise in the open air, a moderate use of drastic purgatives, with Submur. Hyd. and Pulv. Antim. combined, are to be used. A succession of small blisters to the hypochondriac, sacral, and uterine regions, will be found serviceable.

In young persons suffering either under retention or suppression, with tendency to phthisis, symptoms very characteristic of this latter malady often exhibit themselves, before it is at all established. The pulse is accelerated long before there is any pectoral affection, except mere breathlessness; there is considerable emaciation, and the sufferer perspires freely at night. Sooner or later pain in either side of the chest is complained of, but it is not increased by a full inspiration; there is also cough, but it rarely troubles the patient except when she rises in the morning, and then in paroxysms, with a trifling expectoration of mere mucus. The cough is not of that incessant tickling kind which attends disorganization of the lungs from tubercles; but unless the health receive attention, the case may certainly in a short time terminate in phthisis. Patients of this description should betake themselves to some quarter of the globe where the climate is congenial and steady. The chest should be encased in a warming plaster, and the whole body in flannels. The general abstraction of blood, though often practised, is a remedy which, generally, does not appear well suited to cases of retention or suppression; wherefore, except for the relief of urgent symptoms, it is to be avoided. The bowels are occasionally to be gently moved by the most agreeable of the Neutral Salts, moderate exercise in the open air inculcated, and a milk and farinaceous diet prescribed. Pains in the chest or hypochondriac regions are to be relieved by leeches, and a succession of small blisters. Damp clothing is to be particularly avoided, as well as exposure to moist cold weather. And it is of the utmost consequence to keep the mind at all times as agreeably occupied as possible.

Sect. XXI.—*Dysmenorrhœa.*

Though this is not a fatal complaint, it is nevertheless as difficult of removal as any in the whole catalogue of female diseases. In many instances it is coœval with the primary appearance of the catamenia; while, in other cases, the secretion not only shows itself from the first without any pain, but continues to recur in the most natural manner for a long period, when, in consequence of some change in the general system, its elaboration is attended with the most excruciat-

ing suffering. Though the unmarried be the most liable to it, yet it is occasionally met with among matrons. Of the former who are most disposed, we may particularize females strongly stamped with appearances indicative of the various modifications of struma, phthisis, individuals of originally feeble corporeal stamina; those of exhausted bodily strength from previous disease, long continued mental distress, or laborious occupation in an impure atmosphere. In this catalogue must also be included, persons of a plethoric habit, those of acute feelings, and such as follow a sedentary occupation. When the catamenia are attended with much pain, their quantity is very generally scanty, but we occasionally meet with cases where there is great uneasiness though the secretion be sufficiently copious, especially among matrons; nor must I forget to mention, that scanty menstruation is not always painful.

Some of the causes of dysmenorrhœa are constitutional, others acquired. Under the former head may be specified, structural lesion of any particular organ in the chest or abdomen. In females verging towards puberty, in whom there is a tendency in any viscus to become diseased, as for example the lungs, or the liver, the organs of reproduction, in consequence of the increased determination to those in a morbid state, are impeded in their development, and hence scanty secretion. Paucity of the menses may, in its turn, lay the foundation for disease of other organs; and it would seem that there is none more susceptible of derangement from such an agent, than the liver. Under the head of acquired causes, I may specify local or general debility, exposure to cold, the sudden abstraction of the stimulus of sexual congress, over-indulgence in it, repeated abortion, frequent mental excitement. In the unmarried, dysmenorrhœa, and scanty secretion, may be induced by causes which, in matrons, would have little if any influence. The uterus in the latter performs in most instances, its functions to the last, even under circumstances of great prostration, of which phthisis affords a good illustration; but in the unmarried, this organ is much more susceptible of functional derangement. Paucity of the secretion is not always to be ascribed to debility of the reproductive system alone, for this local prostration may be a mere sequence of general weakness. How often is diseased menstruation met with in young females who pass a great part of the twenty-four hours in the vitiated atmosphere of a crowded, ill-ventilated factory, or even in well-aired ware-rooms, although, for the first few years after the manifestation of the secretion, it was natural in quantity, and elaborated without

pain. Exposure to cold, while a young female is under the influence of the catamenia, frequently leads to premature suppression, and very probably severe pain, at the succeeding monthly indisposition, unless the case receive timely attention. Widows, who, during their conjugal life, have enjoyed perfect health, often, while in a state of celibacy, gradually become affected with this functional derangement. The influence of continence is so obvious, that it need not be explained. Excess in sexual congress is not an unfrequent cause of dysmenorrhœa in recently married females; *first*, from its leading to uterine irritation; or, *secondly*, from this irritation ending in torpor. Individuals of this character have been known to continue barren for many years.

Of all causes of dysmenorrhœa, cases resulting from repeated abortions are the most obstinate, and especially if the individual be of a strumous habit; and, independently of such patients suffering from severe pain at each menstrual period, they continue barren for a long course of years. The uneasiness after some time diminishes, the secretion also becomes more limited, at last both cease entirely, and a profuse leucorrhœal discharge is substituted. Passions of the mind, as anxiety, fear, and grief, resulting from disappointments in life, acting through the medium of the nervous system, often induce dysmenorrhœa. Imperforation, and preternatural contraction of the os uteri, have been asserted to be causes of this functional derangement; and making an aperture into the organ, or dilating the existing one, recommended, and, as we are informed, practised for relief. But with as much reason, in cases of blindness, from cohesion of the eyelids with diseased optic nerves, might we expect to procure sight for the blind, as to produce the menses, or increase their quantity, in a female with imperforate or contracted os uteri and disease of the ovaries, by forming an aperture into the womb, or dilating the one previously existing. As there can be no doubt that the vagina, under certain circumstances, furnishes catamenia, an imperforate uterus, when it and the ovaries are otherwise well formed and in a healthy state, may be expected to do the same. The dilatation of the os uteri to increase the flow of the menses, is a specimen of great credulity.

The symptoms of this functional derangement, which may often be viewed as the first stage of suppression, in many respects resemble those described in the subject last considered. The pain, which is a source of indescribable torture, is referred chiefly to the hypogastric region, whence it extends to the sacrum, loins, groins, and back of the thighs.

The intestines and urinary organs participate in the derangement, as is indicated by the presence of obstinate constipation and retention of urine. In many cases these distressing sensations precede the menses by a day or two; in others they accompany them; but in either case, the sufferings of the individual are incredible. Occasionally these symptoms are ushered in by one or two rigors of several hours' duration. To the foregoing phenomena succeed an intolerable headache, deep seated pain in the orbits, in the occiput, and in the cervical spine; which, with frequent syncope, and the most violent efforts to vomit, completely incapacitate the sufferer from the most trifling domestic occupation, and compel her to remain in bed for days together. When these complaints precede menstruation, its appearance mitigates them, especially when it is natural in quantity; but when they accompany it, they continue for two or three days, or cease with it. The vomiting is sometimes a profuse hæmatemesis. Dysmenorrhœa is sometimes attended for a day or two previous to any other indisposition, particularly in spare irritable females, with feelings in the abdomen and pelvis which equal in violence, and imitate in sensation, the most powerful parturient efforts. Hysterical paroxysms, under the most aggravated forms, are sometimes observed. In some cases this straining is present only in a slight degree, for a day or two, till the catamenia appear, when it becomes violent; while, in other instances, its commencement and cessation keep pace with similar states of the secretion. Occasionally borborygmi so loud attend, that the individual cannot appear in society.

From the peculiarly excruciating sufferings of the patient, and consequent excitement, the vascular and nervous systems present considerable evidences of derangement. Within a few days of the time when the secretion should appear, the individual is either peevish, watchful, and very susceptible of impression, or there is universal torpor, indicated by want of animation, indifference towards surrounding objects, even of the most interesting character, and an unconquerable aversion to exercise. With the secretion, sometimes coagula, at other times, both in matrons and in unmarried females, a structure of the appearance of a membrane, is passed with the menses. Of the coagula, one explanation only can be offered, viz. that, during the violent straining, some of the uterine vessels are forced, and pure blood thrown out. The membranous productions resemble the uterus in shape; they are rarely generated by young unmarried females, but almost always by matrons in connubial life. What we most fre-

quently observe in the secretion of the unmarried who are martyrs to dysmenorrhœa, is a collection of something like insulated fibres. These latter, as well as the membranous productions, are formed, it may be presumed, soon after the cessation of the monthly indisposition, by an effusion of lymph, which is partially organized, blocks up the mouths of the secreting vessels, and thus, by obstructing the secretion, gives rise to the violent straining. From the causes which are generally concerned in producing this derangement, the rapidity with which the ailments of the patient attain a state of severity, and the celerity with which they subside, in most cases too with scarcely any treatment, there cannot be a doubt that in the great majority of examples it is neuralgic. Those cases again in which membranous productions, or insulated fibres are passed, would seem to indicate some degree of vascular excitement.

Females in whom these membranes or fibres are evolved, generally continue barren for some time; but if they pass merely one period without producing them, they may conceive. When the individual once becomes a mother, the disposition to the formation of such productions ceases, until some one of the exciting causes be reapplied; and this has often, but erroneously, given rise to the notion, that connubial intercourse would invariably effect a cure.

Though not a dangerous complaint, yet it is most difficult of removal, and some cases have been known to resist, not only all the most approved remedies, but the most judiciously directed efforts. Examples in which the secretion has been sparing from its primary appearance, are most obstinate, and generally irremediable. Cases complicated with marked evidences of struma, structural lesion of the lungs, liver, or other important viscus, are very untractable. Diseased menstruation supervening to abortion, though obstinate and vexatious, from the circumstance of such patients being generally barren, are not however of fatal tendency, unless scirrhus uteri be superinduced. Cases of painful but copious menstruation are more easily remedied than those in which the secretion is sparing. Dysmenorrhœa may terminate in suppression, phthisis, hepatitis, anasarca, and cancer uteri.

In the treatment, the sufferings of the patient during the paroxysm are to be relieved; and in the next place, such measures are to be adopted in the interval as may be conducive to the removal of this functional derangement. To mitigate the pain and straining, leeches, with warm fomentations, are to be applied to the external parts, or the hip warm-bath is to be frequently used; and an enema composed of two

drachms of Assafœtida, dissolved in twenty-four ounces of warm water, is to be exhibited. The application of leeches to the uterus itself is the most effectual method of using them, and Sol. Op. Sedat. in large doses frequently repeated, is to be conjoined, for allaying pain. Warm water should frequently be injected into the vagina until the catamenia have ceased, to subdue, if possible, that excitement which leads to the effusion of lymph, and consequent formation of the membranous or fibrous productions. This latter practice must also increase the determination towards the uterus, and render its secretory vessels more permeable. It must be upon this last principle that dysmenorrhœa is removed by pregnancy.

The practice, in the absence of the menses, is to use warm clothing, the hip warm-bath morning and evening, for several days antecedently to the appearance of the catamenia, refrain from active exercise during the same period, and take a moderate dose of some resinous aperient every third day. The mental passions are to be sedulously avoided, as also exposure to cold damp weather. Moderate exercise with the limbs is always highly proper. Food of a very stimulating nature is to be avoided. From ample opportunities, I am justified in stating, that the only cases which can be benefited by a connubial life, are plethoric females free from organic lesion, and cases under the same circumstances, in which there is scanty secretion, but little or no uneasiness. The author has been repeatedly consulted in the latter examples as to the propriety of young females marrying; and his opinion being favourable, the hymeneal union has invariably been followed by an improvement in the general health, and pregnancy. During the absence of the secretion, in females who are free from organic lesion, and do not suffer much pain, the author has reason to know that electricity has been found to be highly beneficial. In dysmenorrhœa produced by an irritable state of the uterine system, as is occasionally met with in females recently married, and after an abortion or premature labour, not only the conjugal embraces, but every cause calculated to occasion excitement of these organs, must be scrupulously avoided. Where there is reason to suspect general exhaustion, or torpor of the organs of reproduction in particular, such means are to be adopted as are calculated to exert either a local or general influence, as the Aromatic Bitters, foot exercise, or riding, the use of the Sulphureous Mineral Springs, frictions upon the hypogastric and sacral regions, electricity, and the occasional use of the Pil. Aloet. In females of a strumous habit, and those in

whom there has been a paucity of the secretion from its primary appearance, there is reason to apprehend want of development of the genital organs; in which cases, with the plan particularized in examples of diminished energy, a residence in a warm climate should be recommended.

Sect. XXII.—*Menorrhagia.*

When the uterine secretion appears more frequently, continues longer, or is more profuse than natural, the case is styled menorrhagia. But some writers of the present day confound under this head all sanguineous discharges per vaginam: as there is a considerable difference, however, between the *menses* and blood, the term of this section should, in strict etymology, be confined to cases in which the effusion preserves its catamenial character, viz. does not coagulate. It is rarely a complaint of virgins, but frequent in female cooks, drunkards, and in those who live luxuriously; in matrons, and more especially in those who have had a large family. It occurs in two conditions of the system; *first*, one of plenitude and activity; and, *secondly*, one of debility and relaxation. The former is encountered among females of vigour, enjoying ease and comfort; and the latter, in persons whose circumstances are diametrically opposite. Rising too early after parturition, especially where this process has been protracted, and where lactation has not been undertaken; repeated abortion; habitual straining while at the commode; active exercise of any kind, such as dancing and mental excitement, may all lead to it; as may also unusual irritation of the uterine system from over-indulgence in sexual congress.

The catamenia, so far from being only secreted monthly, appear twice, or oftener, during that period; they may continue eight or ten, in place of four or six days; and the quantity elaborated may amount to eight, instead of four ounces. In other instances the discharge continues only for a day or two, when it ceases, and then reappears for a few days longer, at the termination of an equal interval. At other times the effusion is profuse, during one or two periods only, after its reappearance, when the patient has been, from any cause, for some time obstructed. Menorrhagia is attended by pain in the lumbar and sacral portions of the spine, uterine region, and inability to remain for any length of time in the erect position. There is a lassitude, sense of unusual weight in the pelvis, irritation and itching of the external genitals, and coldness of the sacral limbs, all of which subside when the flow commences. These latter phenomena,

however, are more obvious in cases in which the effusion is rather sanguineous, than purely catamenial.

The necessary steps should be early adopted to remedy this state, since it is unfavourable to conception, and disposes to hæmorrhage and abortion in the early months. In occasional instances of females in this country, profuse and protracted catamenial discharge is as habitual as in those residing under the tropics, in which cases no injurious result need be apprehended.

In attempting relief, the patient is to be cautioned against the exciting causes; and such measures are to be adopted as shall tend to remove those conditions on which these diseases depend. If the cause be of a delicate nature, the sentiments of the practitioner are to be communicated to the sufferer through the medium of a third party. Absolute quiet and rest, conjoined with a bland abstemious diet, must be observed for some days before the irruption and during its presence; as also, rigid abstinence in cordials. When the secretion is so immoderate that it requires to be restrained, this can be accomplished by small doses Acet. Plumb. et Op. combined, Secal. Cornut., Tinc. Mur. Fer., vel. Acid. Sulph. Aromat.; and by occasionally sponging the external genitals with cold water and Acetous Acid. During the flow, the recumbent posture is highly proper, but an overload of bed-clothes, and warm apartments, are to be avoided. The flow is so profuse in some instances that it is necessary, more especially in delicate subjects, to stuff the vagina; which is best accomplished, not by one large piece, such as a half handkerchief, but by smaller portions successively introduced, after previous immersion in cold water. The ergot, either in powder or infusion, will be found of great utility in these cases. In the absence of the effusion, vigorous plethoric individuals are to be restricted to the antiphlogistic regimen in all its details; and venesection, or leeches applied to the groins, have a salutary effect; the latter are to be preferred when there is much susceptibility to impression. Foot exercise is highly proper, but it should never be carried the length of causing fatigue.

When the subject is of a relaxed habit of body, a diametrically opposite plan, in many respects, must be pursued; tonics are to be ordered, and the plunge or shower cold-bath daily; or the immersion of the nates merely, in cold water, will be found of essential service. A dry, nourishing diet, is to be recommended, with a moderate proportion of Port Wine. The patient should be directed to be as much as possible in the open air, and gentle exercise on foot is highly

advantageous. Instead of free purgation, as in a state of activity of the system, we are, in cases of relaxation, to use mild laxatives, and there is none more eligible than Pil. Rhei. I have great doubt as to the safety of powerful styptic injections thrown into the vagina, so strongly recommended by some practitioners; for if such remedies do not actually give rise to scirrhus uteri, they certainly hurry it on where there is a tendency to the disease.

Sect. XXIII.—*Hæmorrhage.*

Effusion of blood from the unimpregnated uterus, though occasionally followed by unpleasant results, is not, however, so formidable as flooding from the gravid womb. This, and the subject considered in the last section, often co-exist, as is proved by the presence of coagula in the menses. The causes of this affection may be gleaned from what has been stated in the preceding article; certainly the conditions which predispose to it are local or general relaxation, and plenitude of the uterine or of the whole system. Repeated abortions, severe suffering during parturition, as also assuming the erect position too early after the latter process, are very common causes of uterine congestion. *The exciting causes* may be such as shall operate by producing increased action of the uterine vessels, or by retarding the circulation in the corresponding veins. The former have been particularized in the foregoing section, and the latter may be tumours, or any organic changes which shall impede the return of the blood to the heart. Hæmorrhage is not an uncommon occurrence in polypus and other structural lesions of the uterus.

The patient complains of pain in the loins and sacrum, a sensation of weight and uneasiness in the pelvis, tension and venereal sensations in the external genitals, with coldness of the lower extremities. When the flow commences, these wear off, and are followed by pallidness of the countenance, languor, lassitude, and an inability to keep the body erect. If the discharge be profuse, impaired vision, tinnitus aurium, and syncope, are induced, followed in protracted cases by susceptibility to impression, sallowness of the skin, and œdema of the sacral limbs. Syncope, though a formidable symptom in appearance, is not so in reality; since by it, the velocity of the circulation is checked, and consequently the discharge; but convulsions, which occasionally also take place, are most ominous.

In the treatment we must be regulated by the condition of

the system. A vigorous plethoric subject will require the same management as other cases of active hæmorrhage; and the remedies are to be employed according as they are intended to have a local or constitutional influence. Venesection, purgatives, nauseating doses, Tart. Antim., Acet. Plumb., et Secal. Cornut., affect the system generally; and cold applications, and stuffing the vagina, are the best local agents.

In a plethoric state of the subject, venesection is almost always sufficient; but when it is not, cold applications will be found valuable adjuvants. The external genitals are to be sponged with cold water, and when the discharge is profuse, this last should be injected into the vagina. Stuffing this canal with soft linen previously immersed in cold water and acetous acid, by favouring the formation of coagula, will be found of essential service in arresting hæmorrhage. With these steps must be conjoined, absolute rest in the horizontal posture, a strict observance of the other parts of the antiphlogistic regimen, and a spacious, well ventilated apartment. The individual must be restricted in the use of all fluids, to prevent the renewal of plethora.

When general relaxation seems accessory to the production of this affection, besides the remedies already particularized for moderating the discharge, tonics must be employed, such as Sulph. Quin. in substance, or a solution of it in water or wine, according to the degree of debility. Colombo and Canella Alba are valuable medicines under similar circumstances. A dry, nourishing, but digestible diet, must be recommended, with cold bathing, and a country residence. *In all cases of this nature, the uterus should be examined per vaginam, to determine whether there be any organic disease.*

Sect. XXIV.—*Final Cessation of the Menses.*

The period at which this function ceases is very much regulated by climate. In temperate countries, this rarely happens prior to forty, or after fifty years of age; somewhat later in high latitudes, but considerably earlier under the tropics. Many troublesome complaints to which there was formerly a tendency, are apt to be called into action at this epoch, though, paradoxical as it may seem, it is proved by the researches of M. Benoiston, that this is not the most fatal period for the sex. When about to cease, the discharge at first becomes irregular, disappearing altogether for two or three months, and then for a time returning; or instead of ceasing for several periods, its visits are regular; but on each occasion, the quantity is gradually diminished.

When this change has commenced, hysterical affections, under a variety of forms, torture the patient. Among these we may mention, violent headaches, vertigo, tinnitus aurium, a spasmodic cough returning by paroxysms, often excited by mental emotion. Sometimes the ailments are entirely confined to the abdominal viscera. An obtuse pain in either hypochondriac or iliac regions is not uncommon. Generally, the appetite is much impaired, and the bowels are constipated; but often a trifling circumstance produces diarrhœa, as, for example, mental emotion; and flatus in the stomach, and borborygmi in the bowels, are a source of excessive annoyance. Among the ailments which are apt to arise, we may mention, in connection with the nervous system, excessive languor, disinclination to exertion, and in those predisposed, apoplexy or mania. Hæmoptysis and phthisis are occasionally witnessed, even where there is no predisposition. Chronic hepatitis, icterus, and scirrhus of the mammæ and uterus, not unfrequently appear after the menses have ceased. The system ultimately acquires so great a degree of susceptibility to impression, that the least *unexpected* noise, or even a harsh word, will excite disturbance, apparently formidable, in several functions. These numerous complaints result from the suppression of an accustomed discharge, and from the danger which, according to the sex, is inseparable from such a change; wherefore they style it the critical period.

In the management of these cases, the great object is to avoid all causes calculated to induce the abrupt suppression of the menses, or uterine irritation in any shape; wherefore, exposure to cold, and mental emotions, are sedulously to be avoided. When irritation from congestion is troublesome, it is to be subdued by leeches or cupping on the temples, back of the neck, sacrum, or groins; by purgatives, and by interdicting the free use of liquids. A large addition of the Ext. Hyos., Assafœt., or Ipecac., to whatever aperient may be preferred, will be found useful. In the selection of these remedies, we must be regulated entirely by the vigour of the patient, and the urgency of her symptoms. Exercise in the open air is indispensable; and it will be of great moment to contrive occupation for the mind as well as the body. A country residence will be highly useful, as it enables the individual to enjoy pure air and exercise, without that extreme attention to toilette which is observed in town, and which, from the trouble it occasions, detains many in the house for days together.

Sect. XXV.—*Hysteria.*

This disease may assume a variety of forms; and one of its principal features is, to do so in quick succession. It is generally characterized by an individual complaining of some derangement of several regions simultaneously, as the head, chest, or abdomen; while, apparently, she is free from indisposition. The only peculiar symptom, perhaps, is the sensation of a ball ascending from the abdomen to the throat; but when an opportunity has been afforded of witnessing a regular paroxysm, if it were but once, the disease may readily afterwards be distinguished, even though the globus hystericus be absent. In young females it is generally very regular; but in the aged, it is very much the reverse, and presents a variety of shades. Sometimes the patient would seem to be suffering from severe cerebral excitement, as is indicated by the presence of excessive headache, strabismus, a sensation as if a nail were forced into some part of the scalp, incoherent language, spasms, pain and hardness of either mamma, uneasiness over some of the superior dorsal vertebræ; some alarming disturbance of the respiratory organs, as dyspnœa, or hæmoptysis; serious derangement in the vascular system, as violent palpitations, and irregular action of the arteries; with formidable gastric symptoms, as obstinate dyspepsia, or hæmatemesis; and, as already stated, the transition from the one to the other is sudden. The uterine system is most frequently involved; and the urinary organs do not escape. Individuals labouring under hysteria have undergone regular treatment, upon the supposition of the uterus being affected with inflammation; and Sauvages relates a case in which the practitioner was so much deceived by the symptoms, that he proceeded to use the sound, conceiving the bladder to contain a calculus.

Occasionally the sufferer cannot describe her feelings; she appears dull, thoughtful, and courts solitude; and what would be a source of recreation to her in health, is void of attraction while she is in this condition. She is sometimes also much annoyed with languor and lassitude, yawning and stretching, susceptibility to impression from the slightest causes, expulsion of flatus from the stomach, borborygmi, and an utter dislike to any exertion.

In those who are martyrs to the malady, the paroxysm, generally, is easily excited; so trivial a cause as walking against the wind has done so; but all the mental passions are very certain of accomplishing it. The fit, when distinct-

ly marked, begins with pain and tension near the umbilicus, which sensations gradually ascend to the throat, constituting the globus, from the patient feeling something like a ball in the œsophagus, where it induces a sense of suffocation. This phenomenon is a spasmodic action, transferred from the uterus to the other viscera which it affects. The woman is now seized with convulsions, which are attended by distressful sobbing, alternate weeping and laughing, distortions of the features, palpitations, impaired vision, loss of hearing, speech, and occasionally of muscular motion; and sometimes there is total insensibility, as if the individual were in a state of complete syncope; in which some persons have been known to continue for a considerable time. Some of the sphincters are violently contracted during the paroxysm; that of the anus has sometimes been found so much so, as to resist the transit of an enema pipe. After a period of varied duration the struggle terminates, and recovery, considering the apparently formidable condition of the patient, speedily takes place. This is accompanied by a feeling of languor, general prostration, discharges of flatus from the stomach, and sometimes of a copious flow of limpid urine; in some rare instances, however, the kidneys do not act, but the exhalation by the skin is increased in the same ratio, as happened in the case of a young person of eighteen years of age, related by M. Pomme. Here the action of the kidneys was completely suspended for more than two months, and restored by the use of cold baths.* In many cases consciousness remains during the fit, as may be presumed from the patient being afterwards able to relate conversations which had been held by the attendants at the time. This should suggest caution to a practitioner in expressing his opinion of the probable termination of the disease.

The duration of the paroxysm may extend from a few minutes to several hours. A hysterical syncope, again, has, in occasional instances, continued for a much longer period, and communicated so much the appearance of death to the individual, that there are not wanting cases in which the friends consented to anatomical inspection, or preparations for inhumation, by which such females have been roused from their profound torpor. The celebrated anatomist Vesalius had been so much imposed on by appearances, in a case of this nature, that he commenced to open the body, when the first stroke of the scalpel brought the woman to her senses, and apprised the operator of his error. The Journal

*. Traité des Affections Vaporeuses des deux Sexes, p. 168.

de Savans, for 1745, contains the case of the lady of Colonel Russel, who continued in a similar state for eight days; and who, but for the profound grief and devoted attachment of her husband, which would not permit him to separate himself from the body, would have been interred by the friends.

Females of an ardent disposition, of an irritable habit of body, whose health has been undermined by mental emotions and disappointments, such as are of a sanguine, plethoric temperament, and individuals descended from parents remarkable for their liability to nervous diseases, are most *disposed* to this affection. *The exciting causes* are very numerous; all the mental passions may be viewed in this light, more especially those arising from disappointments in a marriage settlement. A lady was known to the author, who, from the latter causes, had acquired so high a degree of susceptibility to impression, that whenever such a subject became the topic of conversation she was either seized with hysterical syncope, or convulsion; but she possessed the power of preventing the accession of either, when called upon, by those who were aware of her disposition, and recognised the approach of the attack, to resist them. There is no cause of more assured influence than uterine irritation, whether arising from continence, or excess in connubial intercourse; and suppression or profuse flow of the catamenia; and structural lesions of the ovaries, or of the uterus. Two cases have been communicated to the author, the one by his much lamented and late highly valued friend Dr Duncan, jun., Professor of Materia Medica, and the other by an esteemed pupil, now many years in practice, where hysteria had been induced in two different matrons by satyriasis in each of their husbands, arising in both of them from diseased prostate gland. In each husband the desire for connubial intercourse was so ungovernable, that the ladies were reluctantly compelled to solicit a confidential interview with their family medical attendant, who succeeded in subduing the morbid state of the prostate, when the inordinate desires subsided.

Hysteria of an irregular and most obstinate description frequently occurs in females about to be finally obstructed, or soon after the catamenial departure. Moreover, this is the period at which structural derangements most generally commence to exert their influence.

The disease consists in irritation of the nervous system, and more especially that portion of it which is allotted to the organs of reproduction. In these it may originate and be propagated from the extremities of their nerves to the encephalon. Or the complaint may be superinduced by structural

derangement of the cerebellum, as arterial or venous congestion; and the uterine system, from being in a state of predisposition, becomes affected in its turn, through the medium of the eighth pair, sympathetic, and splanchnic nerves. But it is not to be inferred, as the name of the disease would imply, that the uterus is invariably involved, since it has been encountered in males, as stated in Dr Trotter's Medicina Nautica, and in females who were perfectly free from uterine derangement.

The treatment divides itself into such means as have the power of allaying the paroxysms, and into those required for improving the system, to prevent a recurrence of them. Antispasmodics, as Æth. Sulphur., Opium, or Assafœtida, are the most powerful agents. A solution of two drachms of Assafœtida, in a pound and a half of warm water, should be thrown into the rectum; and a large dose Sol. Op. Sedat. and Æth. Sulph. combined, exhibited by the mouth. Camphor is a valuable remedy, when a patient has no dislike to its odour.

To prevent a recurrence of the paroxysms, such of the exciting causes as are under control, must be avoided; and where the disease seems to arise from *particular excesses*, our sentiments must be communicated to the patient through the medium of a nurse. When plethora predominates, and the complaints of the patient, such as headache, vertigo, tinnitus aurium, and suffused eye, indicate encephalic plenitude, the back of the neck must be freely cupped or leeched, the bowels acted on by purgatives, and the antiphlogistic regimen in all respects judiciously conducted. Of late years much benefit has been derived in this very complaint, from the use of aperients solely; but their exhibition requires discrimination. In plethoric vertiginous females, with obstructed catamenia, the free use of resinous cathartics is highly eligible; but in delicate individuals, and those of a spare irritable habit, the occasional use of the mildest laxatives will suffice, such as Pulv. Jalap. C. Pil. Rhei., Pil. Aloet. cum Gum. Assafœtid., and Sulph. Potass. c. Sulph. The Sulphureous Waters are highly proper. With these remedies, exercise on foot, or equitation should be conjoined; but when the patient cannot be advised to go abroad, as frequently happens, this desirable object may be accomplished by stratagem; we have merely to mention the name of a practitioner residing at some distance, as being celebrated for the cure of such diseases, and the sufferer will at once undertake the journey, which, from the travelling and mental occupation, the change of air and scenery, have led to the happiest results. The benefit so often derived from visiting places resorted to for the

use of the mineral water, may be similarly accounted for. In some instances fear has been known either to prevent the accession, or retard the progress of the paroxysms.* The individual should likewise be encouraged to be frequently in society, and to frequent places of public entertainment; but sedulously to avoid such scenes as tend to excite the passions.

When hysteria seems to arise from paucity, suppression, or profusion of the catamenia, the various plans recommended in speaking of these subjects, must be pursued. Sometimes it is connected with a prostrate condition of the uterine system, in which cases it will be necessary to excite these organs by frictions with Unguent. Tart. Antim. over the sacrum; and allusion should be made to the benefit which has been known, in such cases, to result from matrimony. Where the disease arises from continence, as in youthful widows or others, and under all circumstances where there are no structural derangements, connubial enjoyment is often followed by relief. Sea-bathing, and the aromatic bitters, under circumstances which will suggest themselves to a practitioner, are proper.

Sect. XXVI.—*Prolapsus Uteri.*

This organ sometimes gradually sinks from its natural position in the brim, into the cavity of the pelvis, which change is termed descent; thence it may progressively slip into the vagina, which constitutes the second stage of the displacement, styled procidentia; or it may protrude beyond the vulva, which is the third stage, and to which, strictly speaking, we should apply the term prolapsus uteri. When we are early consulted, these different stages may be easily traced; but from the reluctance of the sex to disclose complaints connected with the genital organs, even the second stage is far advanced, or we may find the displacement in the third stage, when application is made. Individuals whose pelves are large, such as are of a relaxed habit, those who have borne a numerous family, and females advanced in years, are the most disposed to it. No age, however, is exempt; for the author once encountered complete protrusion in a female of twenty-one, who, by account, had laboured under it for more than two years previously; and Dr Munro relates an instance where it was prolapsed in a child three years old, and Capuron one where this happened in a girl of fourteen.

* Villermery, vol. i. p. 64.

When the complaint is in the *first stage*, there is pain in the loins, extending along the sacrum and coccyx, with a gnawing or dragging sensation in the groins, and inability to continue for any time in the erect posture; all which is often considered by the patient as the effect of debility or of rheumatism. These symptoms are occasionally attended by an increase of the menstrual secretion; and when it subsides, by a leucorrhœal discharge more or less profuse. In the *second stage*, there are many unpleasant sensations, which are referable to the altered situation of the uterus, and the pressure which it exerts on other parts; as some little difficulty in exonerating the rectum and bladder; or, in some instances, actual inability until the displaced organ be elevated by the finger. There are tenesmus and dysuria, which, with the leucorrhœal discharge, increase as the second stage advances. Unusual weight in the pelvis, and a dragging sensation in the iliac regions are now constantly present, and are aggravated by the erect posture. The case may long continue in this state without making further progress; and if the individual conceive, as often happens, the disease is for a time removed; but unless she remain sufficiently long in the recumbent posture after delivery, it is almost certain to return. Very frequently, the complaint is owing to premature exertion, or the erect position having been too early assumed after child-birth. In other instances, the displacement has been known to declare itself for the first time in the early months of gestation.

The feeling of a foreign body in the vagina, warns the practitioner that the complaint is in the second stage, and the patient, of the displacement of some viscus, which, perhaps, she apprehends to be the bowels, and upon this supposition immediately sits down and crosses the limbs to frustrate their descent. If an examination be made, the uterus is felt nearer the external parts than usual, or its aperture and cervix to project slightly from the vagina. Every function which requires much action of the diaphragm, or other abdominal muscles, progressively advances the uterus towards the os externum, until a considerable portion, or the whole of it, be at last pushed *extra vulvam*, which state constitutes the *third stage*. Though the complaint is thus aggravated, yet, contrary to what happens in most other diseases, some of the uneasy sensations of the patient are now relieved; the urine and fæces, for example, are voided with greater freedom. To counterbalance this immunity, however, the pain in the loins and perinæum becomes more troublesome; and as the uterus is liable to be irritated by the friction of the clothes and the flowing of the urine, it may sooner or later become

the seat of troublesome excoriation or ulceration. The exterior of the prolapsed organ is now however covered by the inverted vagina, which from exposure soon ceases to secrete, and resembles the external surface. A descent of the womb favours a similar change in the floating viscera of the abdomen, and, with the altered position of the vagina, exerts considerable influence on the function of the bladder. This latter viscus is dragged downwards and backwards, so that its position, as well as that of the uterus, becomes horizontal, and the urine, instead of being discharged obliquely downwards, flows straight forward, or directly upward upon the lower part of the abdomen. The uterus, from its vessels being over-stretched, and the organ itself being embraced by the vagina, becomes, from interrupted circulation, tumefied, sometimes to an incredible extent. Ultimately this organ and the inverted vagina, containing some of the floating viscera of the abdomen, form an immense tumour between the thighs; in which condition, the author has known some females not only perform the duty of efficient servants for a long series of years, but even conceive. One female of irregular habits assured the author, that when she was last impregnated, the uterus was *extra vulvam*, and with the inverted vagina formed a tumour which projected about 4 inches from the os externum, and was 12 inches in circumference. From an early period, however, the digestive organs are impaired, the patient has a sallow emaciated appearance; there is too often an end to all connubial enjoyment; this affects the happiness of the sufferer, gives rise to many hysterical symptoms, and the general health is gradually undermined.

Every kind of active exercise during the menstrual period, may operate as an *exciting cause*, as walking to excess, jumping, dancing, lifting heavy bodies, straining; and, in short, every exertion by which the diaphragm and other abdominal muscles are much excited. Assuming the erect posture too early after parturition, is a frequent cause; and in a state of bodily relaxation, repeated paroxysms of coughing may give rise to prolapsus. The relaxed condition of the uterine attachments during the presence of the catamenia, and the weight of the organ itself in the puerperal state, will explain the *modus operandi* of the foregoing causes. Although, considering the extent of practice which I have witnessed, my experience in extensive lacerations of the perinæum has been limited, yet my conviction is, that such injuries favour the descent of the uterus. Another cause of some influence, though little noticed, is a state of relaxation of the vagina,

which drags the uterus after it. Premature rupture of the membranes of the ovum during labour, the womb being drawn into the pelvis around the head of the fœtus, by the violent action of the abdominal muscles, may be considered among the causes; for the uterine attachments, by being thus distended, long continue in a state of relaxation. We cannot explain this variety of displacement, except by admitting the presence of relaxation of the uterine attachment and of the vagina, or the superincumbent pressure of some morbid growth.

Although *the diagnosis* would seem to be easy, yet some extraordinary mistakes have been committed, by the protruded organ being considered as a polypus, and *vice versa*.

When it is wished to acquire a knowledge of the case and the extent of displacement, it should be remembered that all periods of the day, and all positions of the patient, are not alike favourable to the attainment of this information. The individual should be examined in the evening, and in the erect posture, rather than in the morning, and in the recumbent position; and that the uterus may be freely pendant, the bladder and rectum should be empty at the time. When these directions are carefully observed, it is almost impossible to mistake the case. Polypus of the same organ, or of the vagina, is the only affection with which the present complaint can be confounded; but these excrescences are softer and less sensible than the uterus; while their apex, which is imperforate, is thicker than the base; and they cannot be reduced. If any doubt exists, the nature of the case must be decided by ocular inspection.

There is no immediate danger to be apprehended for individuals in this state, which, when the necessary protection is afforded to the misplaced organ, by defending it from the friction of the clothes, and from being washed by the urine, may interfere very little, at least for a long period, with the occupation, or general health of the patient. It may, in progress of time, undermine the constitution; or the woman may fall a victim to repeated attacks of inflammation of the protruded organ. Another mode of termination, which may happen in cases where the viscera have been long misplaced, is adhesion betwixt them and the vagina, and consequent incarceration where their reposition is persisted in.

In the treatment,the practitioner has a two-fold object in view; *first*, to replace, and, *secondly*, to secure the reposition of the uterus. The former part is easily effected in all recent cases; but the latter, in persons who gain a livelihood by much bodily exertion, is difficult, if not impossible; though no doubt it may be accomplished in those who have it in their

power to enjoy quietude, and pass a great part of their time recumbent. When the disease is in the first or second stage, a suitable posture on the part of the patient is all that is required, or the misplaced organ may be pushed back into its proper position by the fingers, and retained *in situ* by a pessary. Females in the humbler spheres of life cannot generally afford to indulge so long in a proper posture, as the removal of the disease requires; but those who can, should be recommended the use of a couch for at least five or six weeks. From four to six ounces of Oak Bark Decoction, Sulphate of Alum Solution, or one part of Pyroligneous Acid, and five parts of water, should be thrown into the vagina three times daily; and the hip cold-bath conjoined morning and evening. The bowels are to be kept free by means of enemata. Straining is to be sedulously avoided, and the patient confined to one floor of the house, until the cure is completed. A *dry* nourishing diet, and a moderate allowance of red wine, are proper.

Except where the individual cannot avoid bodily exertion, pessaries are rarely required in the first or second stage; nor has the author ever considered these contrivances of further utility in any stage of the complaint than as mere palliatives. The most eligible, by far, are those made of hard wood, hollow, and egg-shaped, where such palliatives cannot be dispensed with. They should be formed with circular depressions, or a circular line of perforations; by the insinuation of the soft parts into these depressions or apertures, an instrument of diminished volume will suffice; it is more securely grasped by the vagina; and is thus calculated to afford more efficient support to the uterus. In the use of these inventions, it is a point of the greatest moment to select as small a one as may be thought sufficient, in order to encourage the canal to contract; and that the same object may be attained, the instrument employed should be exchanged from time to time for one somewhat smaller. When introduced, it rests upon the perinæum, and thus prevents the descento f the uterus. For the sake of cleanliness, it should occasionally be withdrawn; for where this has been neglected, it has in some instances become so imbedded in fungous growths, as to require the knife for its removal; or it has, in consequence of ulceration, escaped into the rectum, or through the parietes of the abdomen. In trivial displacements, the instrument may be withdrawn while the patient is in bed. In long existent, and large protrusions, a pessary is worse than useless. The best contrivance in all cases of prolapsus, could the sex be advised to employ it,

would be an instrument made of silver, the form and thickness of the *flat* female catheter, like it cylindrical, from eight to nine inches in length when straight, and thereafter bent into the form of the capital letter U, the two limbs, at the centre of the bent part, united by a very moveable joint, or the instrument constructed so that the halves may be joined by the uniting extremities being furnished, the one with a small fenestrum, and the other with a hook. The length of this contrivance must be regulated by the depth of the pubes and the corpulency of the patient; and although, to resist corrosion, I have directed it to be made of silver, nevertheless, if the material employed were of such a composition as would not only resist the action of acrid discharges, but with this principle also combine a considerable degree of flexibility, for the better adaptation of the instrument in its introduction and application, a double and most important advantage would be gained. It being inconvenient for a practitioner to conduct the intra-pelvic portion, owing to its shortness, towards the os tincæ, it is necessary that this part of the instrument at least should be cylindrical, that a probe or some such contrivance may be introduced within it to assist in advancing it to, and within, the uterus. We shall not consider it necessary to describe the position in which the patient should be placed during the introduction of the instrument, nor the steps to be observed in accomplishing this object, as these must suggest themselves to every person who has pretensions to obstetric practice. The one extremity is for *introduction into the uterus*, and it should terminate in a globular form; and the opposite limb, to extend upon the mons Veneris, should be furnished with a fenestrum to receive a piece of tape sufficiently long to encircle the body, and secure the instrument in its situation. The great objection to pessaries, and one indeed which all must admit, to say nothing of the irritation which their presence in the vagina must excite, is, that they keep the sexual canal in a state of dilatation, and thus perpetuate the displacement. From this latter objection, at least, the plan now recommended is entirely free.

When the patient declines to avail herself of the use of this simple contrivance, a firm hair compress, inclosed in an oil-skin bag, should be placed upon the perinæum, and supported by means of the spring bandage, used for prolapsus ani; but this, as well as the application of a pad or compress, as recommended by Duncan and others, can only be considered as mere palliatives. When these extensive and protracted protrusions have been reduced, the subsequent feel-

ings of the patient should be carefully watched, to determine whether any of the viscera be incarcerated, from their having cohered to the inverted vagina.

In 1823, it was proposed by M. Gérardin to accomplish the radical removal of prolapsus uteri by cauterization,—a practice which was adopted some years afterwards by M. Langier and others unsuccessfully.* To this, followed in our own country, by Dr Marshall Hall and others, the removal of a triangular portion of the mucous membrane of the vagina,—the apex of the excavation being formed towards the uterus, and the detachment effected at either side only, on both sides at the same operation, anteriorly or posteriorly and at the uterine or vaginal orifice. A mere strip of the mucous tunic only is to be removed, involving as little as possible the adjoining tissues. Three ligatures are to be introduced into the margins of the excavation, but not tied until the whole are inserted, when the uterus must be pushed upwards, after which the ligature nearest it is the first which should be tied, and the other two in succession. There can be little hæmorrhage in performing this operation, and when necessary the effusion can be restrained by cold applications. The object of the proceeding now described, which has been repeatedly successful, is to occasion contraction of the vagina, and prevent the descent of the uterus. Although the result may be permanently successful in females who have ceased to bear children, I cannot believe, notwithstanding the testimony of Dr Frick,† derived, as we are informed, from actual practice, that were the vagina to be dilated by the transit of a mature fœtus, after a woman had been successfully operated on, but what the barrier constructed by the operation would be destroyed, and prolapsus re-established.

When much uneasiness, sickness, or vomiting, follows the reduction of the tumour, its speedy protrusion must again be encouraged, as the only means of affording relief; and the patient must be satisfied with its suspension, *extra vulvam*, by a proper bandage. The extirpation of the uterus, an operation soon to be considered, has been spoken of in cases of this nature, but except where there is suspicion that the organ is cancerous or scirrhous, its advantages would seem problematical, since the peritonæum, from its extensibility, would, through time, yield to the pressure of the intestines, and be followed by the formation of another tumour.

* Blatin et Nivet, Maladies des Femmes, p. 473.
† Transac. Provin. Med. and Surg. Assoc., vol. v. p. 92.

Sect. XXVII.—*Tympanitis Uteri.*

Air occasionally accumulates in this organ, either in consequence of its being secreted, or relaxation of the uterine tissues; and though, from the cavity being small, the quantity cannot generally be great, yet its escape is attended with an explosion so loud, as to occasion to the patient an uncomfortable feeling. Reasoning from analogy, morbid changes, such as chronic inflammation of the mucous lining, may lead to the generation of gas, as may also, but in much larger quantity during pregnancy and after delivery, decomposition of the fœtus, or of portions of the placenta; but judging from my own experience I can say that such occurrences, either in the unimpregnated state or otherwise, are exceedingly rare. I have been consulted by very young females, but oftener by those advanced in life. In the unimpregnated state the air is not offensive, though this cannot be the case when it is the result of decomposition of the uterine contents. The nature of the complaint requires to be explained to the sufferer, to prevent her supposing that there is a breach in the rectum, which is a natural conclusion, and one that occasions much inquietude.

Our information as to the organic changes is almost conjectural, since so few opportunities of dissection have been afforded. Dr Churchill quotes from Frank two cases of this complaint; in the one, dissection displayed ulceration of the internal surface of the uterus; in the other, the os tincæ was obstructed by a polypus.

The *symptoms*, besides the intonations, are such as usually characterize uterine irritation, as pelvic uneasiness, accompanied with a sense of tension, enlargement of, and milk in, the mammæ, and impaired digestion. In the few instances that have fallen under my notice, I could not decide satisfactorily, that the uterus was increased in bulk, although Frank relates a case in which its size equalled that of the gravid organ at the full time. One of these for whom I was consulted conceived while annoyed by this complaint, as did also one of Dr Gooch's patients;* and Frank likewise relates two cases where impregnation happened under similar circumstances.

In regard to the diagnosis, I have much difficulty in believing, in despite of Dr Frank's case, in the possibility of air accumulating in the uterus in such volume as to lead to this complaint being confounded with advanced pregnancy, any

* Diseases peculiar to Women, p. 233.

variety of dropsy, or morbid growth of magnitude. To arrive at any thing like a correct diagnosis, the disease must be traced to its origin, and if we find that the patient has been molested with vaginal explosions, the nature of the complaint is obvious. Patients themselves naturally doubt, as some of our own brethren have done, the uterine origin of the air; but in one of Dr Gooch's patients, as also in my own, the intonations ceased when conception happened, and returned after delivery in the case related by Dr G.,—a satisfactory proof of their source. When air is expelled per vaginam, it may be distinguished from that which escapes from the rectum, by the patient, in the latter case, being sensible of its transit, and being able to prevent its sudden expulsion; while, in the former instance, she has no such power, nor is she aware of what is to happen, until she is made sensible of it by the noise. The air may be prevented exploding by a catheter, or bougie, being constantly retained in the canal of the cervix, and cavity of the uterus; and by an attempt being made to remove this uncomfortable state, by the use of tonics, the hip or general cold-bath, and moderate exercise in the open air.

Sect. XXVIII.—*Dropsy and Hydatids of the Uterus.*

Cases are met with, in which this organ furnishes a preternatural flow of aqueous fluid, which may be retained in consequence of obliteration of the canal in the cervix, closure of the aperture of the uterus, or the fluid being contained in one large, or a number of smaller cysts, usually styled hydatids. Though we sometimes observe a copious watery effusion *per vaginam*, yet it is impossible to decide whether it is furnished entirely by this canal, or by the uterus; nor can we say that it has not been contained in a cyst; for though no production of a membranous nature is to be felt or seen, it is nevertheless possible for it to be dissolved in the discharge, and be thus got rid of unobserved. The effusion, although most frequently as thin as serum, sometimes, however, becomes mucous, or albuminous; and should the deeper structures of the uterus become affected, the discharge assumes a thick dark coloured aspect. In quantity, also, the fluid has differed most remarkably; for, although frequently it does not exceed a quart, yet in a case related by Blankard, 85 pounds, in one by Vesalius, 180, while Bonet recorded an instance in which the uterus was distended so enormously, that it could have contained a child six years old. In a case of this nature under the care of the author,

some years since, the woman, who was the mother of a family, again considered herself eight months pregnant, when one day while suddenly stooping, she felt as if something had given way, when immediately thereafter so large a quantity of clear fluid issued per vaginam as to inundate the floor of a small apartment: it was estimated at a gallon and a half, and was followed by syncope.

The morbid appearances vary much in different cases; for while in some instances nothing could be discovered to account for a large accumulation of fluid,* in other examples the uterine tissues were greatly disorganized,† softened, or indurated;‡ which mutations tend to increase the secretion from the inner surface of the organ, and likewise to obliterate the canal of its cervix and aperture. On the subject of causes we cannot advance beyond conjecture: blows on the abdomen, and circumstances calculated to produce chronic excitement of the uterus, may be ranked among the number.

In regard to the symptoms, besides the stillicidium, the patient labours under numerous complaints, usually styled nervous or hysterical, the result of uterine irritation; and when the catamenia are present, they are remarked to be more pale and watery than usual. Instead of a constant stillicidium, occasionally the fluid is discharged at intervals in gushes, as if something had, for a time, obstructed its escape. When the fluid is retained, an elastic, moveable body, resembling the uterus, permanently affected with obtuse pain, can be felt emerging through the brim of the pelvis, accompanied, in protracted cases, by dyspnœa and tumidity of the breasts, which have a knotted feel and contain milk; ultimately the countenance presents a sallow, haggard, emaciated appearance, the appetite is impaired, pulse accelerated, bowels irregular, hæmorrhoids form, and the ankles become infiltrated. By a vaginal examination we readily trace the tumour to the uterus, the cervix of which is shortened, distended, and conveys a feeling of fluctuation.

A *diagnosis* is accomplished with difficulty, owing to the striking resemblance of some of the phenomena to certain natural and diseased changes which may be established. From the suppression of the menses, engorgement of the mammæ, and tumidity of the abdomen, pregnancy might be suspected; but the absence of a well-marked areola, of fœtal movement, and of the stethoscopic phenomena, must undedeceive the practitioner. From *ascites* it is to be distin-

* Med.-Chir. Trans. Lond., vol. xiii. part i. p. 170.
† Transac. Provin. Assoc., vol. iv.
‡ Diction. de Méd. et de Chirurg. Prat., Art. Hydrometré.

guished by the general health not being early or much impaired, by the swelling being circumscribed, and by the urine not being diminished in quantity until an advanced stage. With scirrhous enlargement it can scarcely be confounded, since the swelling is soft, and free from acute pain.

The termination of these cases may, after a time, be abruptly fatal, from the uterine parietes being attenuated by distension, and consequently ruptured. More frequently, however, life is destroyed by exhaustion, owing to the long confinement, and the superinduction of hectic fever. For a considerable period there may be little constitutional disturbance, especially if the fluid be occasionally evacuated; and, moreover, the patient has even been known to conceive.*

Hydatids in utero are supposed to be produced by the ovum having become blighted in the early months, or by the retention of a portion of the placenta, either after an abortion, or the expulsion of a mature fœtus. Except in one instance, related to him by one of his pupils, the author never heard of a case in which they were produced by an unmarried female, but always by persons in constant intercourse with their husbands. As their presence is attended by many of the same phenomena which accompany pregnancy, and the formation of polypi and moles, their existence cannot be determined, except by some of them being voided, or the occasional occurrence of a watery stillicidium. When they are the result of a blighted ovum, we have at first all the symptoms of pregnancy well marked; but when the diseased membranes cease to be properly nourished, shivering is among the earliest indications of this event, followed by cessation of the morning sickness when present, and flaccidity of the mammæ. The abdomen increases in size as the contents of the cyst or cysts accumulate; this, however, takes place slowly; but as there is no perceptible movement, the patient suspects that there is something unusual in her situation. Milk is rarely secreted until the effusion in the womb has been evacuated; the catamenia are not elaborated, but there is a discharge of a sanguineous nature, which appears at irregular periods. Unless these bodies be retained until the latter months, their contents are seldom considerable; and it is only under such circumstances that this state exerts any influence on the health, which is rarely affected when the cluster of hydatids is small; but large accumulations are accompanied by general fever, and distressing dyspnœa. Sometimes where the function of gestation has been regularly

* Churchill's Diseases of Females, p. 151.

performed, the womb has contained hydatids which have been discharged with, or at the lapse of some weeks after the birth of, the fœtus.

Their formation has been said to depend on the presence of animalculi, but this opinion has no supporters among pathologists of the present day. The general belief is, that they result from diseased changes of the ovum. We sometimes find the chorion studded with them, or a portion of the placenta hydatiginous. From the general testimony, observation, and reflection, it is my firm belief that they originate in some morbid change of the ovum. A uterus containing these productions rarely attains the magnitude of one with a solitary cyst, for they are generally thrown off from the third to the close of the fifth month; but in some rare instances, they have been retained to the beginning of the eighth. The amount of the fluid they contain is various; when there are many, their aggregate contents are rarely considerable. The author has seen them expelled in clusters, equalling the largest bunches of grapes; but in such cases, each vesicle has rarely exceeded in size a small gooseberry or grape, while many of them were not larger than a swan shot. Their expulsion is attended with a copious, bloody, serous effusion; and the straining efforts are quicker in succession, but not of such duration as the pains of labour. As they are attached to a foot-stalk, some of them are separated and thrown off, before the entire mass is evacuated. *Our prognosis* where there is a cluster of hydatids, may be favourable; for the author has not only seen the most perfect recovery, but he has known individuals conceive soon after the expulsion of such productions.

As it is difficult to determine whether the condition of the patient arise from disease, or the establishment of a natural function, the practitioner will require to be very cautious in his interference.

In regard to the treatment in these cases, when we are unable to discover a hydatid, or that there is organic disease, and that the complaint consists in a mere stillicidium, the abdomen should be bound up, aromatic tonics, as Colombo, and Canella Alba, given internally, and some mild astringent in a tepid state, thrown frequently into the vagina. The patient should be ordered a plain abstemious diet. Where the pulse is excited, and there are other symptoms of irritation present, tonics in every shape are to be prohibited, and leeches applied to the groins.

When there is enlargement of the abdomen, of slow progression, unaccompanied by fœtal movement, but attended

by occasional discharges of blood and water, if there be any urgent symptom, as troublesome dyspnœa, the os uteri must be cautiously dilated, and the sac containing the water punctured. If any hydatids escape during this attempt, the nature of the case is rendered more clear, and the complete expulsion of the uterine contents is to be encouraged, by the exhibition of ergot, frictions on the abdomen, and compression by the binder. When efforts at expulsion or frequent inclinations to strain have supervened, and we are satisfied of the presence of fluctuation, while the equivocal signs of pregnancy are absent, there should be no temporizing, the uterus should be evacuated at once by a trocar and canula passed through the os uteri, whenever it is sufficiently dilated, lest by the attenuation of the parietes the organ might be burst. To prevent this untoward result, the uterus itself has been punctured above the pubes with success by Wirer,* and a large quantity of fluid abstracted; but I cannot help being of opinion, that puncturing the uterus per vaginam would be fully more eligible, and not less safe and successful. When the womb has been evacuated, the belly should be bound up, as after parturition. So long ago as the time of Ætius, it was customary in cases of hydatids, to inject into the uterus a solution of the Muriate of Soda, to which M. Percy has added a proportion of Acetous Acid, with success. In all such examples, the patient should be recommended a mild course of Mercury and tonics, to induce a new action in the system.

Sect. XXIX.—*Moles.*

Hydatids having with seeming propriety perhaps, been included in the last section, this will be devoted to what are usually styled moles. These masses are various in their volume and structure, and may be referred to two heads; *first*, such as exhibit distinct traces of having been ova; and *secondly*, those of confused formation. Though it be stated by modern as well as ancient writers, that these bodies have been generated by virgins, yet the author has never met with an instance of the kind; but he has known them to be produced by females who have been long barren, and others who were too far advanced in years to bear children: but reasoning from analogy, he thinks they may be organized in virgins, since in the oviparous race, ova are formed without the influence of the male.

* Churchill's Diseases of Females, p. 152.

Blighted conception is a term which should be restricted to those productions which afford evidence of being remnants of an ovum, by the mass enclosing the membranes of an ovum, or a fœtus with its involucra in a great majority of them, the membranes only, with a little fluid, are to be seen, but no fœtus. In the plates of Dr Denman, and also among those by Dr Granville, are delineations of a very rare specimen of blighted ovum, and of which I have one in my collection. It was obtained from a woman who considered herself seven months pregnant; but the ovum, which was expelled entire, did not exceed the size of the largest orange. Externally the membranes appeared natural, but when the sac was laid open and inverted, the placenta, instead of being soft, was of a firm fibrous texture, and the whole surface covered by nodules varying in size, and of a cærulean colour. The fœtus, the size of the largest fly, was still present, and appended by a funis fully an inch in length, to one of the nodules; and though so small, the rudiments of the thoracic and pelvic limbs can be recognised.

Those of *confused formation* are of three kinds; *first*, a variety which resemble layers of coagulated blood, separated by delicate membranous septa; and if placed in water, they continue to impart a sanguineous colour to many successive changes of it; *secondly*, a variety which are of a firmer consistence, quite fibrous, and in shape resemble the uterus; and *thirdly*, a variety of a very indurated texture, and indefinite in their form. The author has had occasion to remark, that the first variety is generated by females who are bearing children; the second, by those who have been for some years barren; and the third, by such as are too old to be impregnated. In one instance, he has seen expelled with an ovum of the sixth month, a mole of the same size, of the first variety of the second order. In volume they rarely attain that of a hen's large egg; more frequently they do not exceed that of a pigeon. Their expulsion takes place some time during the third or fourth month; they are very rarely retained to the fifth. There is nothing in the structure of any of these three varieties to justify the opinion, that they had ever been an ovum.

As to their formation, they are supposed to originate in the degeneration of the ovum, owing to some defect in the function of gestation; in an effusion of lymph and subsequent organization of it; and in a morbid condition of the menses. Whatever may be said to the contrary, the author will not hesitate to assert, that the presence of moles cannot be determined before their expulsion; all the phenomena which accom-

pany their formation, are exactly the same as those of true pregnancies. The expulsive process is a protracted one, and is attended with much oozing of blood. We may give a favourable prognosis. Their formation, except in females who have been barren for some time previously, does not prevent impregnation.

As to the treatment, since their expulsion is slow, and the long continued discharge of blood alarms the patient, while it excites a numerous train of nervous symptoms, their removal ought to be accelerated by the finger, the exhibition of ergot and enemata, and the application of the binder as in a female in child-bed. As they have sometimes been generated under circumstances of diminished, and at other times of increased activity of the system, a generous, or antiphlogistic regimen must be recommended, according to the patient's state of health. When their development seems to be connected with a diseased state of the catamenia, a mild course of Mercury, judiciously conducted, should be recommended; and after the woman has become obstructed, she should be advised to avoid every variety of uterine irritation.

Sect. XXX.—*Polypus Uteri.*

We find these bodies in the sinuses of the brain, cavities of the heart, and in the larger arteries or veins.

They are generally found in cavities, or organs which are lined with mucous membrane; and the situations in which they are most accessible to the practitioner, are the nares, ears, rectum, uterus, and the vagina. The observations to be offered in this section, will, for obvious reasons, be limited to their formation and management, as they appear in the two latter situations. These excrescences, until their pedicle is exposed to pressure, are of a pale colour; but thereafter they become purple or blue. They increase in size with a celerity proportioned to the capacity of the cavity which contains them; in the uterus, therefore, their development is slow. In its form as well as volume, much depends on the locality in which it is developed. Sometimes we detect them before they have exceeded the size of a garden pea; but they have occasionally been known to equal in volume the heart of a large quadruped. These growths are of a longitudinal form at first, but as they enlarge, they represent the shape of the cavity in which they are contained. They may grow from any part of the fundus, corpus, or cervix; and we sometimes find them even on the margin of the os tincæ; and in like manner, they may take their origin from any point of the vagina.

The author has known their development commence so near the os externum, that he has, in several instances, been able to apply a ligature on them without the aid of an instrument. When they originate from the fundus or body, and protrude from the os uteri, the finger can describe a complete circle around their pedicle within a sheath formed by the cervix; but when they grow from this last, either the os uteri cannot be felt at all, or the index can be passed only partially round the pedicle. In one instance of vaginal polypus, under the care of the author, the excrescence commenced so near the entrance of the canal that the os externum could not be traced until after the tumour had been detached.

They are arranged into *three varieties*, according to their texture, viz., fibrous, cellular, and glandular. *The fibrous* vary in density of structure, not only in different cases, but even in different portions of the same excrescence; and the larger the tumour, the more dense its texture: on this point we can speak more satisfactorily when it has been excised than when removed by ligature. In some rare examples they are hollow, containing grumous blood, hair, or adipose matter. It is covered by the lining membrane of the uterus, with which organ it is united either by cellular tissue or by being imbedded in its deeper structures. When it increases in volume, however, the uterine parietes are so much attenuated, that we find but a very partial production of them subjacent to the mucous membrane which covers the pedicle; but my firm conviction is, that frequently the polypus in its early stages has no connection except with this latter structure. Except in very rare instances, these productions are by no means vascular; and we can in no way account for the attendant profuse evacuations of blood so satisfactorily, as by ascribing them to some condition of the uterine vessels. In colour they vary from that of the external surface, to a dirty yellow aspect; and when noosed they assume a cerulean shade from interrupted circulation; afterwards they become rapidly dark. I consider this the most frequent variety of the three.

The *cellular variety* are less frequent than either of the others; they vary in colour from light red, to pale or yellow; they grow singly or in clusters; they are soft and lobulated; and their connection with the uterus is more superficial than the foregoing.

The glandular polypus is frequently developed in clusters, which are appended to the uterus by a slender pedicle. They are considered as enlarged Nabothian glands. Their struc-

ture under the knife is soft, in resemblance of glandular substance.

Of the causes Walter's theory is by far the most plausible: he ascribes their origin to irritation, giving rise to an increased afflux of fluids towards some point of a mucous membrane, with subsequent concretion, which becomes organised. No age is exempt from them. Though elderly women, and those who have had a numerous family, seem most apt to produce them, I have known them appear, however, in unmarried females not far advanced in life.

The symptoms are very ambiguous when the excrescence is situated in the uterine cavity, until its elongation and descent force the os tincæ to dilate, when the true cause of many phenomena designated nervous and hysterical, with obtuse pain in the hypogastric region, are elicited by examination. In occasional instances, however, it is difficult, if not impossible, to form a correct notion of the nature of the patient's indisposition, even where exploration has been resorted to; and hence, then, the necessity of insisting, in every complaint of the passages, on this mode of ascertaining our information. And even when examination is submitted to, little can be learned unless the os uteri be sufficiently dilated to receive the finger, or the excrescence protrude from this aperture. Among the early phenomena, are an increase of, and irregularity in, the appearance of the natural secretion; and a preternatural flow of mucus after it has subsided. As the size of the excrescence increases, a sensation of tension in the hypogastric region is complained of, as also dysuria, and constipation; and if an examination be submitted to, the whole womb will be felt distinctly enlarged. There is an inclination to bear down, with tenesmus, and a dragging sensation. Disturbance in the uterine system is followed by impaired digestive function, and general languor; and from these latter phenomena, females who are not too far advanced in years, are apt to consider themselves pregnant.

According as the polypus distends the uterus, this organ is excited to react on its morbid contents, and to effect their expulsion. These efforts are attended with almost constant uneasiness in the pelvis, loins, groins, and thighs; and the womb is at last carried near the os externum. When the os and cervix resist the descent of the tumour, it may acquire considerable magnitude before it protrudes into the vagina, and create great and general irritation. There is impaired appetite, constant and severe nausea, probably from loss of blood and uterine irritation, relaxed bowels,

œdema of the pelvic limbs, an ensanguined emaciated countenance, and palpitations. The flow from the parts is much increased, and presents a purulent sanguineous aspect, which, with the excessive effusion of blood, and constitutional irritation, leads to dangerous exhaustion. It has been said that hæmorrhage is less profuse in polypus of the cervix than in those growing from other parts of the uterus, but the author is now entrusted with a case in which the effusion has been alarming, though the excrescence is attached to the cervix uteri. After the escape of the polypus from the womb, there is an alleviation of all the patient's sufferings, for the tumour is now in a cavity of greater capacity and dilatability. This relief is but temporary, however, for the frequent discharges of blood and general irritation ultimately destroy the patient. In some fortunate examples, the os tincæ, by firmly grasping the pedicle, has suspended the circulation in the tumour, and thus effected its detachment: when this happens, it is interesting to know, that the separation does not take place where the pressure of the uterine aperture is applied, but where the tumour is implanted, as happens when the umbilical cord drops off. When the connection of the polypus with the uterus has not thus been destroyed, the growth gradually occupies the vagina, where, as its volume increases, it causes disturbance of several functions, from its pressure on the rectum and bladder. By careful examination in such cases, we can trace something like a double tumour; the lower one formed by the excrescence; and the upper, which is far the more sensible of the two, by the womb, perhaps more or less inverted. The growth, however, may attain a very considerable volume without producing inversion: the author possesses a uterus without even a tendency to inversion, though originating from its cavity, by a thick pedicle, there is a polypus of the cellular variety, as large at least as a sheep's heart. It was obtained from a woman who died at the age of fifty-two, and whose case was not properly understood until it was too late to attempt her relief.

When polypi grow from the outer surface of the cervix, or from the os uteri, the derangement is trifling for a long time; there is no sanguineous effusion, and the mucous discharge is but little increased, since the morbid growth is not much compressed. Where it originates from these latter points, or from the vagina, the patient is first made sensible of its presence by inclinations to strain, and by the sensation of a foreign body in the canal, or protruding from the os externum. Some years ago a professional friend sent the author a polypus, fully larger than the clenched hand of an adult.

It occasionally protruded slightly from the vagina: and by the patient, who considered it as the uterus, it was as often replaced, without consulting any one, until on one occasion its reduction was followed by an effusion of blood, which caused alarm, and induced the sufferer to call her medical attendant, into whose hand, while examining its nature, the tumour dropped from the passage. It seemed to have grown from the os or cervix uteri, and it presented but a circumscribed point of attachment.

When the polypus does not block up the os tincæ, or uterine extremity of the Fallopian tubes, the patient may conceive; and the author has in his collection one of the shape and size of the tongue of a sheep, which was expelled after a severe paroxysm of uterine pains, a few days subsequent to an abortion of the fourth month. Though in some instances where the womb has contained a polypus, pregnancy has been completed, yet, generally, premature labour is induced.

The diagnosis betwixt polypus uteri and pregnancy is a practical point of great importance, but the line of demarcation is not easily drawn in the incipient stage of either, or until the period has arrived at which quickening should take place, or the stethoscope can be used with effect. A polypus gives rise to the same symptoms almost as a fœtus or a mole. When an excrescence of this nature, however, is contained in utero, the organ is felt enlarged; the catamenia continue to recur, but are irregular, either in the period of their appearance or quantity; there is an increased flow of mucus; the os tincæ is more patulous than usual; and the nipple is not surrounded by an areola. But it is proper to remember, that these latter distinctions cannot be relied on; and it may relieve the anxiety of the practitioner to be informed, that until the polypus can be felt by the fingers, the greatest practical acumen cannot determine its presence. We must endeavour to distinguish it from the uterus itself, to avoid including this organ in a ligature.* A polypus may be known by its pedicle having the cervix uteri for its sheath, by its lower end having no perforation, and being thicker than the upper one. The uterus may have been partially inverted during the expulsion, or soon after the birth, of the fœtus, and the accident remain undiscovered until some future period when the case is mistaken for polypus of the uterus,† as the inverted fundus, like that excrescence, is sur-

* Uterus included in a ligature, by Dr W. Hunter, patient died. Gooch on Diseases peculiar to Women, p. 265.

† Dublin Hospital Reports, vol. iii. p. 495.

rounded by the cervix for its sheath. The only circumstances, in diagnosis, that can with any certainty guide the practitioner, are the previous history of the patient, the greater sensibility of the tumour on examination, its rotundity, and in long existent cases, the hæmorrhagic effusions being less profuse, and occurring only at the catamenial periods. Fortunately, however, even if the nature of the derangement be not recognized, the mistake can make no difference in the practice, with this exception however, that in a case of inversion the ligature must be tightened *more progressively*. It is almost unnecessary to notice the mode of distinguishing polypus from some malignant diseases of the uterus, as cauliflower excrescence, and scirrhous enlargement: these are rarely, even for short intervals, free from pain, have no pedicle; and the former is tuberculated, and bleeds from trifling irritation,—conditions perfectly distinct from those by which polypus is marked.

In regard to the prognosis, when the disease has been early discovered, the excrescence accessible, and its pedicle slender, a favourable opinion may be delivered, for it can be removed with very little suffering. When the tumour is large, with a broad base, our opinion must be guarded; for a polypus of this character, owing to the existing constitutional derangement, and the degree of irritation which must be excited during its separation, may be followed by fatal consequences; but from the successful results in cases where the pedicle was even several inches in circumference,* we must not decline to adopt the necessary steps for the detachment of the excrescence. The case is also to be considered critical when there is exhaustion, with occasional effusions of blood.

For the removal of polypi, cauterization, excision, caustic, and torsion, were the methods pursued until the latter half of the last century; but the occurrence of hæmorrhage, in a prostrate state of the system, and the induction of violent inflammation, together with a knowledge of the important fact that nature sometimes accomplished the separation of the tumour, led to the adoption of what is generally considered a safer method. In the early part of the last century, Levrèt proposed and repeatedly effected the separation of these tumours by compressing their pedicle with a ligature, applied by means of two separate canulæ; a method which, with some modification of the instrument employed, has since been generally preferred.

Previously to our entertaining the propriety of an opera-

* Gooch on Diseases peculiar to Women, p. 277.

ation we have first to consider, by the careful examination of the pelvis, whether the polypus be sufficiently far advanced and disengaged from the uterus. If it be not protruded to the necessary extent for the application of a ligature, the ailments of the patient are to be palliated until efficient steps can be adopted. Should the use of the ligature be resolved upon, the best contrivance, beyond all comparison, for accomplishing this, is that by Dr Gooch; of whose description of it, the following is an abridgement. It consists of two silver tubes, each eight inches long, straight, separate from each other, and open at both ends. A ligature of strong whip-cord is to be passed up the one tube, and down the other, the ligature passing across from the upper end of the one into the upper end of the other, and the two ends of the ligature passing out at the lower extremities of the tubes, which are now to be placed side by side, and guided by the finger along the vagina to the pedicle of the polypus: The tubes are now to be separated, and while the one is fixed, the other is to be passed quite round the pedicle, till it arrives again at its fellow tube, and touches it. Thus it is obvious the pedicle is encircled by the ligature. The two tubes are now to be joined by two rings united at their edges, sufficiently large to slip over the tubes, and passed up until they reach the upper ends of the tubes which they will preserve in contact; two similar rings, connected with the foregoing by a silver rod, are slipped over the lower ends of the tubes so as to bind *them* in like manner. The ligatures are now to be drawn down until some degree of uneasiness be felt in the tumour, after which they are to be entwined around a fenestrum with which the exterior edge of the outer extreme of each tube should be furnished. It is unnecessary to place the ligature high up, since we are now aware that the whole of the pedicle of the tumour sloughs away, though the compression has not been exerted near its radix,—and since it would be very unsafe to encircle the pedicle too high, lest, in case of inversion of the uterus, a portion of the organ might be included. The ends of the ligature are to be drawn downwards daily, until a slight degree of uneasiness be felt, when we are to desist, and to secure them upon the fenestra. Should much pain at any time be complained of after the pedicle is embraced, the ligature must be slackened; and if this step be not followed by relief, leeches are to be applied to the groins, and warm water frequently thrown into the vagina. Scrupulous attention must be paid to cleanliness of the passage while we are conducting the separation of the tumour; and a spare vegetable regi-

men, with absolute quiet, is to be observed. A difference of opinion exists as to the kind of ligature which should be used, but it is the impression of the author, that the one now particularized will answer every purpose.

For polypi with a thick pedicle, there cannot be a doubt of the superiority of the ligature, which must be progressively drawn tighter, as a due observation on its effects shall point out; but when the stem is small, even though the excrescence should be of considerable size, either excision or torsion will be preferable, that protracted irritation may be avoided. Although polypi are rarely very vascular, yet, as in a few instances, pulsation has been felt in the stem, the practitioner, in the event of his performing excision, must guard against hæmorrhage, lest, though not profuse, it might, in a system previously much exhausted from this very cause, reduce the patient to a critical state. When pulsation is felt in the pedicle, there cannot be two opinions as to the greater safety of the ligature than either of the other methods.

Sometimes the tumour is so large, that, after its separation, a hook, or some other mechanical contrivance, may be required for its extraction. Under similar circumstances, to guard against prolapsus uteri, the cold hip-bath, and the recumbent posture, should be indulged in for some time after the removal of the polypus.

Sect. XXXI.—*Irritable Uterus.*

This is a disease which, within the last few years, has been described by respectable authorities, both on the continent and in this country, as Nauche and Gooch. But though this state be familiar enough to the practitioner, the term applied to it does not seem sufficiently expressive of its nature. Hysteralgia, as adopted by Villermay, is more applicable. *The chief predisposing cause* is general irritability of system, or remarkable susceptibility to impression; but it may be met with in females of every temperament, and from an early period after the menstrual secretion is established, until it is about to take its final leave; young matrons, however, are the most liable to it.

The *exciting causes* are numerous, but of these we shall merely mention a few by way of illustration, and the remainder will readily suggest themselves to the practitioner. There are none of more assured influence, than the irritation of frequent mental excitement, abrupt suppression of the catamenia, or of any other discharge from the organs of repro-

duction, exposure to cold, abortion, and undue indulgence in hymeneal pleasures. Of the proximate cause little can be said; for, as in affections of the nerves in other parts, so here dissection frequently does not disclose structural lesion, if we except turgescence of vessels; even this is denied by some people, but did they explore the vagina by the speculum? Dr Gooch, in his excellent paper, does not inform us that he had once used this instrument. The general dislike to examination by the ordinary method, and still greater by the speculum, in this country, have led to inconsistent notions of the pathology of the diseases of the internal genitals, and too often to irreparable mischief in the treatment. Now that this false, but otherwise laudable delicacy, is modified, and effectual exploration permitted, we are afforded satisfactory evidence, in many instances, that the os and cervix uteri are swelled; and that these parts, as well as their connecting portion of the vagina, are vividly injected. Recently, at the express desire of a lady, who has for years suffered most severely from the disease, I examined the parts with the speculum, and found the upper portion of the vagina and cervix uteri highly congested, and the latter part swollen.

Dr Gooch will not admit the presence of either acute or chronic inflammation; as the former, contrary to the subject of this section, runs a rapid course; and because the latter is followed by ulceration, which does not happen in irritable uterus. But rheumatism, dysmenorrhœa, and leucorrhœa, are all very protracted, painful, and obstinate diseases; and I presume no one of the present day would say, that some degree of inflammation is not an attendant on these affections, although they are not speedily followed by the destruction of the tissues which are involved. There is, indeed, a strong analogy between them; for hysteralgia, like rheumatism, recurs by aggravated paroxysms, is of protracted duration, and is, moreover, seated in an organ which is, to a certain extent, muscular.

The symptoms are, pain in the lower part of the abdomen, and often in the loins, aggravated by the erect posture and exercise, and diminished by the recumbent position, but not entirely relieved, though the patient may have continued it for a long period. If the uterus be examined, and pressed upon by the finger, *per vaginam*, exquisite sensibility is the result; but the sufferings of the patient in this respect vary, not only at different periods, but also in intensity. The cervix and os tincæ are swelled in different degrees, sometimes manifestly, but in other cases not perceptibly; they are not indurated, nor are the margins of the aperture ragged or

irregular. Though the sufferer be much relieved by quietude and rest, yet no precaution affords perfect immunity from uneasiness. Instead of a general affection of the womb, as specified by Dr Gooch, in some cases which I examined, the patient described her uneasiness as limited to a very circumscribed point. The pain supervenes by paroxysms, frequently two or three days before, or after menstruation, or they are sure to be induced either by walking, or an active aperient. When the individual is in a state of quietude, the pulse is soft, and almost natural; but it is readily excited by mental or corporeal disturbance. The stomach and bowels are not more disordered than we usually find them in persons of sedentary habits. Ultimately we have a countenance which is pallid and expressive of anguish, with excessive susceptibility to impression.

This state of the uterus is distinguished from dysmenorrhœa, by the uneasiness in the latter being present during menstruation only; from inflammation commonly, by the absence of fever and its usual concomitants; and from scirrhus, by there being no perceptible induration of the womb, nor a ragged misshapen state of the os tincæ.

The prognosis is uncertain, for the malady is very difficult of removal in most instances; often, from want of proper applications, since, too frequently, we are denied the inspection of the parts. And though the occasional causes be known, yet some females have not resolution to control their habits, and hence a fertile source of protracted suffering. The disease has sometimes persisted for years; which shows the necessity for rigid attention on the part of the sufferer, and on that of the medical attendant. The author has recently been consulted in the case of a lady in whom the complaint has persisted for seven years, at first induced, and still supported, by over-indulgence in sexual congress; and he is occasionally, also, applied to for another lady in whom the disease commenced five years ago, in consequence of mental distress, since aggravated by severe family bereavement.

In the treatment, we have three important objects in view; *first*, by an efficient inspection of the organs, if possible, to ascertain their morbid state; *secondly*, to relieve pain; and *thirdly*, to improve the general health. *The first indication* is to be fulfilled by the use of the speculum. To accomplish the *second*, we insist on quietude, the recumbent posture, occasional local detractions of blood, hip warm-bath, anodynes, and the regulation of the bowels. In a woman of stamina, abstraction of blood by cupping will prove highly beneficial; but in feeble individuals, leeches must have the preference,

and if the sex would permit their direct application to the irritable organ, they would be highly useful; but when this is refused, the perinæum and anus may be selected. Leeches are to be applied on the points specified, as the vigour of the sufferer, and the symptoms require; but the best situation for the cupping glasses is the upper part of the sacrum. From both observation and reflection, venesection can rarely be useful; for, be the morbid condition what it may, it is local at the commencement; though there can be no question, if it be protracted, that the constitution must ultimately suffer. Softened Opium, aud the extract of Belladonna in form of plaster, very constantly applied upon the entire surface of the sacrum, are useful remedies. To soothe uneasiness, the hip warm-bath will be found advantageous; and we must combine with it, a strong decoction of Poppy-Heads, Cicuta, and Henbane, thrown warm into the rectum. Of all Anodynes given internally, there are none so very useful, as Sol. Op. Sedat., for it rarely constipates. When this last loses its influence, Camphor and Hyosciamus combined, though less powerful, will give relief. Constipation must be sedulously guarded against, that the distressing effects of straining may be avoided. In the earlier stages of the disease, no agent stronger than a mild Enema, Castor Oil, or a little Phosphate of Soda in the morning, and one or two Blue Pills the preceding evening, should be used. Where other remedies have been resisted, Dr Gooch has seen some cases yield to a mild course of Blue Pill, or that of Calomel, with small blisters or issues. These latter medicines, however, must be carefully watched in a sensitive system. Some examples have been benefited by the Chalybeate Springs.

To improve the general health, the individual should be advised, as soon as her powers can support the effort, to withdraw, by the easiest conveyance, from a life of visiting and midnight dissipation in town, to one of tranquillity and retirement in the country. In a state of perfect convalescence, moderate indulgence in foot exercise, and *tepid* sea-water bath, gradually reduced to the frigid state, are proper; and at all periods of the disease, a mild diet should be recommended. An aqueous or vinous infusion of some aromatic bitter, according to the wants of the system, must be ordered. Iodine has been recently exhibited in this complaint.

Sect. XXXII.—*Hysteritis, Acute and Chronic.*

Inflammation of the uterus is a disease which has been as long known to the profession as any we are acquainted with.

It is accurately described by many of the ancients. The morbid action may commence in the peritonæal tunic of the organ, and it may readily extend to the subjacent tissues, and *vice versa*. The lining of the womb may also be the seat of excitement, as in leucorrhœa; but when it commences here, it is not very apt to affect the other structures of the uterus. Fluor albus, indeed, often persists for years without injuring the general health, producing disorganization, or interfering with any of the uterine functions; inflammation of the other tissues, on the contrary, may destroy life in a few days. Hysteritis may exist under an acute or chronic form; most frequently the latter is a sequela of the former; but in occasional instances, the inflammation is of a chronic nature from the first. The disease may extend to the ligaments, tubes, ovaries, and vagina, when the peritonæal tunic, or the substance of the uterus is affected. No age is exempt from it, but it is most frequently observed at the time the catamenia are about to take their final leave.

The influence of those causes which are concerned in other inflammatory diseases, may generally be traced in this; as exposure to cold, local injuries, sudden suppression of the catamenia, and the extirpation of a polypus, from inclusion of a portion of the uterine tissues, besides numerous other circumstances which will readily suggest themselves. But of the whole, there is none more certain in its action than exposure to cold during the monthly indispositions, and their abrupt suspension, by whatever cause induced. In some instances the latter cannot be elicited.

The ordinary *symptoms* of fever generally usher in acute hysteritis, more particularly a rigor, which is succeeded by increase of temperature. But occasionally, there is no shivering; and such cases come on suddenly, and are most insidious; for sometimes the darting or flying pains, as they are styled, in the hypogastric region, are considered as colic, or as arising from the catamenia not having appeared at the regular period, and regarded as of little moment, until the malady is too far advanced to be arrested. But when there are in the pelvis darting pains returning by paroxysms, with suppression of the catamenia, and increasing frequency of pulse, the most lamentable consequences may result from inattention. This sort of uneasiness indicates that the substance of the organ is involved. When the peritonæal tunic is inflamed, the pain is acute and constant, not recurring in fits. There is a sense of weight in the pelvis, and uneasiness which extends to the loins, vagina, and thighs, and is so distressing that the sufferer can with difficulty remain in bed. In the

acute stage the countenance is flushed, but otherwise it is pale. Whichever of the structures is the seat of morbid action, the circulation is accelerated. If the inflammation commences in the peritonæum, the pulse, besides being very frequent, is hard, and is with difficulty compressed under the finger; but it becomes softer as the substance of the uterus is involved; and this change is succeeded by typhoid appearances, as furred tongue, encrusted teeth, and shrunk features. Taking a deep inspiration, turning to either side in bed, or the pressure of the hand upon the lower part of the abdomen, will occasion much pain. The hypogastrium feels tense, and this increases as the disease advances. It is said that the uterus is enlarged, but this cannot be determined *ab externo*, and not very satisfactorily *per vaginam*, except in the chronic variety. From an early period there is headache, which continues to increase as the malady advances; in many cases the patient also becomes delirious, and has a distressing vomiting, with singultus. The secretion of urine is high coloured, voided frequently, and with pain; and there is an inclination to bear down, with obstinate constipation. There is an increased exhalation from the vagina, and the os and cervix uteri feel harder than usual. The duration of this malady, whether it terminate in health or otherwise, is seldom protracted. By vigorous treatment, resolution is generally effected within twenty-four hours; and the fatal event may happen so early as the fourth day; death from puerperal hysteritis, may often be witnessed from the third to the fifth day. When the disease is protracted in the non-puerperal state, it becomes chronic, and of an untractable character. It may terminate in resolution, suppuration, chronic enlargement, and death; in which last case, the peritonæum is often more or less extensively inflamed, but less frequently in the unimpregnated than in the puerperal state. When an abscess forms, its contents are discharged at some point near the brim of the pelvis, through the vagina, or rectum.

In the *diagnosis* no grave error can be committed, since the disease can only be mistaken for others which require the same treatment. It is scarcely possible to confound it with colic, which is not attended with symptoms of fever, uneasiness on pressure, or pain in the pelvis. Whatever complication hysteritis exhibits when far advanced, the disease is well marked in the commencement. The pulse is sooner affected, and more frequent in its incipient stages than in those of pure peritonitis, in which the pain is constant, and does not attack by paroxysms as in metritis.

The morbid appearances differ, according as the disease may be simple, or complicated, which it frequently is in puerperal patients. In those who are not in child-bed, and have died from metritis purely, we find the uterus in various conditions; much thickened, interspersed with patches minutely injected, general engorgement of the organ, some points indurated, others much softened, with a marked increase of its volume. Lieutaud relates a case in which the os tincæ was obliterated; and I have similar preparations in my collection. When the case has terminated in suppuration, an effusion of pus, with distinct traces of one or more abscesses, is seen.

In regard to our *prognosis*, this is not a dangerous disease in the non-puerperal state, when early and energetically treated; but otherwise the patient will assuredly be lost. Cases superinduced by noosing a polypus, the sudden suppression of the menstrual secretion, and such as appear toward the final cessation of the catamenia, are the most obstinate. Delirium, vomiting, and an extension of the pain over the abdomen, are unfavourable symptoms; and the uneasiness in the region of the uterus, attacking by paroxysms of violent pinching sensations, indicates inflammation of the substance of the organ, which requires a most guarded prognosis. The malady is more untractable in elderly, than in young subjects. A favourable opinion may be pronounced, when the headache is receding, the pulse becoming less frequent, the uterine uneasiness diminishing, and when a copious discharge, mucous or sanguineous, takes place *per vaginam*. We may apprehend *suppuration*, when pain in a subdued state persists at a particular point, accompanied by throbbing, occasional rigors, and diminution of the frequency of the pulse. Mortification is a termination which has been noticed by Morgagni, Lieutaud, Smellie, and others. This change is marked by sudden cessation of pain, shrunk features, typhoid symptoms, weak intermittent pulse, clammy perspiration, and cold extremities.

The treatment must consist chiefly in active local bleedings, with general detractions in a vigorous state of the system, and spare diet. Our principal objects are to effect resolution, and to prevent the disease becoming chronic. To this end, a number of leeches must be applied to the uterus, inner surface of the vagina, or the extremity of the rectum, and their effusion promoted by suitable means. A considerable quantity of blood may be abstracted with great advantage, by cupping over the sacrum. When these measures do not speedily affect the disease, and the sufferer possesses stamina, general venesection must be conjoined. After the

bleeding, a large dose of the Sol. Opii Sedat. should be ordered. The bowels are to be regulated by Ol. Ricini, and warm emollient enemata. For nourishment, the mildest farinaceous matters only, should be allowed. So long as pain persists, though in a subdued state, the application of leeches must from time to time be repeated. Cicuta in powder is a medicine of great efficacy, where the disease shows a tendency to become chronic; and so also is Foxglove in powder; two grains of either, from four to five times daily, *watching the effects*, may be ordered. In like circumstances, blisters to the hypogastrium or sacrum, will be found useful.

Chronic Hysteritis, as already observed, is much more frequently a consecutive, than an original malady. Generally it is a sequela of the acute variety. It is often observed among persons of a strumous habit, and in those who are about to become finally obstructed. Sometimes we are unable to trace the cause. It may originate in the incomplete removal of acute metritis, some injury done to the uterus during parturition, premature and final suppression of the menses, repeated abortions, the use of powerful astringents, syphilis, gonorrhœa, protracted leucorrhœa, and the retrocession of some cutaneous eruption.

In regard to the symptoms, the disease is too frequently in an advanced stage, before it is known to exist, owing to the trifling attendant uneasiness, and the reluctance, in most cases, which the sex have to an examination. Its presence may assuredly be suspected, when there is constant pain, of varied severity, in the region of the uterus, sense of fullness and weight in the hypogastrium, inability to exert the pelvic limbs, constipation, and slight fever. The natural exhalation from the internal genitals is increased, occasionally presenting a purulent, or a sanguineous appearance; when the woman is not obstructed, the catamenia are very irregular in their recurrence and quantity; and the general health is undermined by numerous sympathetic affections. There is a sallowness of countenance, impaired digestion, and prostration of strength. Through the walls of the abdomen, the uterus will be felt enlarged, and *per vaginam* somewhat prolapsed, but not always indurated. In all cases of this nature, *a guarded prognosis* should certainly be made, for it is a most intractable disorder; and when the result is even favourable, it may persist for many months. The termination may be in abscess, with fatal hectic; ulceration, which generally commences in the os or cervix uteri, or even cancer.

In treating chronic hysteritis, we have a tedious task; and too often little can be done by any medicine. We should, in

the first place, direct our attention to the removal of all causes productive of uterine or general irritation, so far as they are controllable. To this end, we recommend a state of absolute rest, a mild, farinaceous diet, and the regulation of the bowels by Pil. Hyd., Ol. Ricini, Sulph. Pot. c. Sulph., or enemata. To relieve pain, leeches, to produce a moderate effusion of blood, are to be placed on the inner surface of the labia and anus, alternately. And as it is essential to economise the strength, the flow should never be so copious as to affect the pulse; wherefore, it is better to repeat their application. The hip warm-bath should be in frequent use. With these remedies, Iodine or Mercury as an alterative, should be tried. The former of these drugs, though its good effects are slowly developed, should nevertheless have a fair trial, as it is an agent of decided efficacy. As an aperient, there is no medicine more useful than Sulph. Pot. c. Sulph.; and the Sulphureous Mineral Springs have often been serviceable. In a state of decided insensibility of the uterus, occasional small blisters, and the moxa, should have a trial.

Sect. XXXIII.—*Tumours of the Uterus.*

These are of frequent occurrence, but generally occasion so little suffering, that they are only elicited on dissection. They may be implanted in all the divisions of the uterus, between the laminæ of the broad ligaments, and in the substance of the ovaries. Their connection with these organs may be superficial, or they may be more deeply imbedded in their structure; they may project from the peritonæal tunic, or from the inner lining of the uterus. They vary in size from that of a pea, to that of a huge mass of fifty or sixty pounds in weight. I once treated a person of seventeen, whose uterus constituted a fibrous tumour of such magnitude, as to equal the size of this organ in the seventh month of gestation; while in this condition, she could walk several miles daily, without inconvenience, and eat and sleep well; she was of a decidedly strumous habit, and during childhood had suffered much from confluent small-pox; she died at a distance in the country, and I never could procure any account of the dissection.

These tumours undergo successive mutations of structure during their development; at first they are fibrous or fleshy, often change to cartilage, then to bone; and ultimately they may be covered by a calcareous shell, but more frequently this matter is deposited in their denser structure. In 1787, Dr Baillie, from having met with a pathological specimen, was

led to suspect, that those bony masses, as he styled them, or calcareous concretions, as they are now called, evacuated from the uterus, were originally tumours, which, while imbedded in the uterine tissues, had undergone successive changes of structure,—an opinion supported by Andral and other experienced pathologists. The author is indebted to the kindness of Robert Brown, Esq., surgeon to the general dispensary, Preston, Lancashire, for an interesting specimen, which occurred in an unmarried woman of sixty, whom it so little incommoded, that it was not known to exist until after death. Gangrene of the lungs was the disease of which she ostensibly died; but on dissection, these developments, large and firm, were not only found in the uterus, ovaries, and broad ligaments, but also in the stomach, liver, lungs, and mammæ. My own experience confirms the opinion, that they are more frequent among single women than matrons; and I am moreover led to believe that they also happen oftener in females who marry late, than in those who do so in early life. Women in this state, unlikely as it may seem, may become pregnant; but the ovum is generally thrown off prematurely.

None of the attendant symptoms are peculiar to this complaint. It commences with a sensation of weight in the pelvis, uneasiness extending thence to the loins and thighs, and inability to move the limbs, more especially after the tumours have acquired any magnitude. There is something anomalous in the menses, which appear irregularly, are more profuse, or continue considerably longer than they are wont. These, with leucorrhœal discharges, which are almost constant, sometimes undermine the health. When the tumours increase in size, they give rise to frequent micturition, tenesmus, and tension in the hypogastric region, which last may induce the individual, if married and not too old, to consider herself pregnant. But the circumstance of a woman in this state having almost no gastric complaint, in far the greater number of instances, even for a series of years, will distinguish it, not only from impregnation, but also from a mole. From scirrhus it may be known by the absence of pain, even upon pressure. The uterus is felt enlarged, in various positions, and its aperture sometimes unusually dilated. All the symptoms may be referred to the mechanical influence of the diseased organ, which, when much enlarged, may excite disturbance in various functions.

To determine the connection of pelvic or abdominal tumours with the uterus, is, under most circumstances, attended with so much difficulty as to dictate extreme caution, even

to men of the greatest practical experience, in giving their decisions. In a corpulent female, no means of exploration we are acquainted with, would encourage a cautious practitioner to express his opinion with confidence; neither can we, when the tumour is of considerable size, determine with any certainty whether it be distinct from the uterus and its appendages, or whether it be not constituted by the uterus itself. We know, that in the healthy condition of the pelvic organs, the uterus is endowed with so great a degree of mobility that it may be much elevated, or with facility moved towards either side in the brim by the fingers, or considerably depressed in the vagina, by a straining effort on the part of the patient. If, in a corpulent subject with uterine derangement, the uterus were found very immobile, so much elevated as not to be reached, per vaginam, or to be so with difficulty, drawn out of the centre towards either side of the brim, or unusually depressed in the pelvis, a practitioner would certainly be justified in the conclusion, that the morbid enlargement was connected with, though not imbedded in, the uterus. In a woman of spare habit, the application of the hand to the brim, while the uterus is elevated therein by the index finger of the other hand in the vagina, will certainly enable a practitioner accustomed to such investigations, to form a very fair estimate of the size and general formation of the uterus; and thus also discover any obvious preternatural formations which might be connected with it. Likewise, by an examination per vaginam, whether the patient were of spare habit or corpulent, the practical accoucheur could decide by the freedom from pain or otherwise, mobility or fixidity, elongation or retraction, unusual volume or the reverse condition of the cervix uteri, and a very patulous, or the natural state of the os tincæ, whether the whole organ, or only a part of it, be involved.

Advantage has been taken of the mobility of the uterus,* to ascertain, by means of an instrument, resembling a male catheter or lithotomy sound passed into its cavity, the existence of various morbid conditions of the organ and its appendages. While introducing this contrivance, we discover by the direction in which it advances, to what side of the abdomen the uterus inclines; and by continuing to push the sound upwards, and at the same time strongly depressing its handle towards the perinæum, we elevate the organ in the brim, and cause its upper regions to be brought in close proximity to the abdominal parietes, whereby in a woman of

* Lond. and Edin. Journ. of Medical Science, August 1843, p. 701.

spare habit an opportunity is afforded of examining the condition of the anterior and superior posterior surfaces of its fundus and body. Again, by raising towards the pubes the handle of the instrument, the posterior surface of the body of the uterus will be pushed against the rectum, whereby we are enabled to examine this part *per anum*.

By the foregoing investigations, some estimate may be conceived of the condition of the uterine parietes, whether they are in their natural state or incrassated, and whether the tumour be formed by the uterus, or by some structure intimately or more distantly connected with it. If, for example, during the transit of the sound into the uterus, this organ does not feel very moveable, if we cannot afterwards draw a distinct linè of demarcation betwixt it and some foreign body, or if the genital organ cannot indeed be defined, we are justified in the conclusion, either that the uterus constitutes the enlargement, or that this viscus and the tumour are intimately connected. But if, on the other hand, while the instrument is introduced, the uterus can be distinctly defined, freely moved, and drags the foreign body but moderately, the inference is legitimate, that their connection is remote. By an examination of the interior of the uterus with the same instrument, were we to experience interruption to its introduction, detect an irregular form, and unusual capacity of its cavity, we should be justified in suspecting the presence of some foreign body in the organ, such as polypi, fibrous tumours, or calcareous deposits.

In regard to the treatment, so long as the general health is unaffected, and the functions of important organs undisturbed, there will be little cause for interference. The patient must abstain from undue exertion, avoid constipation, and indulge in moderate foot-exercise in the open air. When pain arises at any particular point, it is to be subdued by cupping, leeching, fomentations, and avoiding every circumstance calculated to produce excitement, either local or general. I can bear ample testimony in support of the observations published by Dr Ashwell,* in his valuable communication regarding the great utility of iodine in the cases under consideration. By this agent,† I have repeatedly known tumours of great magnitude reduced, which invariably required a considerable period; and, as for a long time there may be no perceptible effect, both the practitioner and the individual under treatment should be reminded of the necessity of patience and perseverance.

* Guy's Hospital Reports.

† See page 503.

Sect. XXXIV.—*Cancer Uteri.*

The various forms under which this disease affects the uterus, will be included in this section. It is much oftener met with than formerly, which may be explained by the fact, that the sex are now less reluctant to permit the pelvic organs to be examined. I must add my testimony to that of other writers in stating, that this affection commences almost invariably in the anterior or posterior wall of the cervix or aperture of the organ, and that its body is comparatively sound, while those parts are much disorganised; but it may originate not only in any part of it, but also in its appendages. Cancer may be defined, a disease which chiefly prevails among females, generally affects glandular tissues, is hereditary, insidious in its origin, slow in its progress, attended by circumscribed induration, followed by mollescence of structure, uncontrollable lancinating pains, and contamination of other glandular organs. As an exception to this definition it must be admitted, however, that excessive pain is not invariably a prominent feature of cancer, as will be presently noticed. We may find the case in a state of scirrhus or open cancer. The os and cervix are variously affected in a given number of instances: *first*, The aperture may be little more dilated than usual, or very much so, irregular in its shape, thickened or attenuated, ulcerated and ragged; *secondly*, The disease sometimes commences by warty-like excrescences of great sensibility, projecting from the os tincæ, and oozing out blood; *thirdly*, These growths may acquire the size of the clenched hand, and from their feeling to the finger tuberculated or warty, have been compared to a cauliflower; *fourthly*, The cervix may be found indurated, thickened, much expanded, elongated, or retracted; *fifthly*, There may be a tumour of a malignant nature imbedded in the substance of the cervix; and, *sixthly*, The uterus may be affected with cerebriform cancer, commonly styled fungus hæmatodes.

In respect to the nature of cancer in general, we are still undecided; and so far from our doubts being cleared up and the subject simplified, the reverse is unquestionably the case, from the excusable desire of many pathologists to immortalize their names by some novel theory more obscure and unintelligible, perhaps, than those which preceded it. Thus, we are told by the distinguished Broussais, that it consists in chronic inflammation; by Carswell, that it is in the blood; by Hodgkin, that a serous membrane, with a cystiform

structure, is necessary; by Cruveilhier, that it is exclusively the result of the deposition of morbid products; by Professor S. Cooper, simply and intelligibly, that it is constitutional; and by Dr Blundell, very properly, that it is seated in glandular organs; while Dr Robert Lee, as usual of course, denies that it commences in the glandular structure of the os and cervix uteri. Carswell, too, denies that cancer is limited to glandular structure; but these instances are so rare, that they certainly may be admitted as mere exceptions. The permanent removal from the mammæ of the disease in an incipient stage, would certainly seem to favour the opinion, that, in the first instance at least, it is a local complaint; while its frequent recurrence in persons who, previously to an operation, had been for some time affected, and in whom there was every reason to believe the whole of the morbid structure had been excised, would, on the contrary, indicate a general disease. The matter of cancer is not contaminating, for it has been swallowed by some of the lower animals, and with a lancet inserted into the bodies of some of our own race, without being productive of the least injury.

Of some of the causes particularised, we have but a superficial knowledge. The disease has been seen at all periods, but it rarely shows itself either antecedently to puberty or during senility. I saw it in a woman of sixty-six, under the care of Dr Crambe of this city.* It usually occurs when the catamenia finally cease. And, though seemingly incredible, I have been consulted by three different women, who, while pregnant, were affected with cancer uteri. Individuals endowed with much nervous susceptibility, and of melancholic and lymphatic temperaments, are *most disposed to it.* The most opposite circumstances have been specified as *exciting causes*, such as excessive *libertinage*, rigid continence, residing in low damp situations, unwholesome diet, and a laborious occupation. I cannot speak with certainty of the influence of these, but I have met with many cases which could be clearly traced to great grief, domestic grievances, attacks of gonorrhœa, and the injection into the vagina of powerful styptic applications. And I have no doubt that various other causes may be added to the foregoing list, as a hereditary taint, blows, abortions, injuries during delivery, premature suppression of the catamenia, and chronic inflammation.

* Of 409 individuals who had cancer uteri, 12 were under 20 years of age, 83 from 20 to 30, 102 from 30 to 40, 106 from 40 to 45, 95 from 45 to 50, 7 from 50 to 60, and 4 from 60 to 71 years of age.—Boivin and Dugès.

The symptoms will be enumerated according as they may be referred to the disease, *first*, In the state of scirrhus; and, *secondly*, In that of ulcerative cancer.

Scirrhus uteri is attended by irregularity in the recurrence, duration, and quantity of the menses. The patient observes that her periods are irregular, that they continue longer than usual, or, when present, that the quantity is greater than customary. In the menstrual intervals, there is a copious leucorrhœal discharge, at first rather thin, but gradually becoming thicker, varying in colour from light to dark brown, green or black, with sanguineous striæ, and being always more or less acrid. Troublesome pruritus, extending from the uterus to the os externum, is another early symptom; as also a sanguineous discharge after sexual congress, and which, though trifling, is often the first circumstance to excite attention. There is a permanent sensation of weight and pain in the pelvis, and frequent desire for micturition. The urine deposits mucus, and the evacuation of the bladder is sometimes attended with so much pain, especially in the latter stage, as to require the catheter. From an early period, there is impaired digestive function, and to this succeeds a numerous train of symptoms usually styled nervous or hysterical, as great susceptibility to impression even from trivial causes, lassitude, uneasiness in the right or left hypochrondrium, sometimes extending into either iliac region; restless nights, and an anxious sallow countenance.

Ulcerative cancer is known by the pain in the pelvis having become very acute, recurring in paroxysms which the largest doses of opium are insufficient to alleviate, and which the sufferer compares to the pricking of pins; by an ichorous discharge per vaginam, alternated by alarming effusions of blood; and occasionally also by the most distressing vomiting. Extraordinary as it may seem, the pain in some rare cases is by no means severe; of which a remarkable instance was under the care of the author in 1840, where, although the cervix uteri was destroyed by ulceration, and the contents of the bladder were escaping involuntarily, yet the patient seldom complained of her uneasiness being acute. In far the greater number of cases the hæmorrhage is more profuse in the commencement of ulceration, than after a considerable breach is established; and it may be remarked also, that from the time a solution of continuity has taken place, the uterus ceases to increase in volume. The glands of the iliac plexus become diseased, as also those of the groins, and cancerous matter has even been found in the

thoracic duct; ultimately the bladder and rectum share in the contamination, a breach is effected in their parietes, and their contents pass involuntarily per vaginam, in which state of torture I have known women survive several months. An examination of the pelvic organs, which should, if possible, be conducted by the aid of a speculum, will detect different degrees of disorganization, according to the duration of the malady. The offensive odour of the diseased secretions is a circumstance of general remark, as also the difficulty of removing it from the fingers, even by repeated ablutions. Independently of the foregoing symptoms, the disease occasionally makes itself known by increasing tumidity of the abdomen. Sometimes the uterus alone is affected; but in other instances, the ovaries also are involved. Some years ago, I repeatedly visited a poor woman in whose abdomen there were three tumours; one in the centre above the pubes, in shape and size like a quart bottle; and another on each side of this, about the form and magnitude of a fœtal cranium. She ascribed her complaint to ill treatment from her husband; she went to reside in the country shortly after I saw her. When the body of the womb is the seat of disease, this is often a sequela of chronic inflammation; the whole organ is manifestly enlarged, and it sometimes acquires a considerable volume before ulceration commences. I saw a woman whose uterus equalled the size of the gravid organ in the seventh month; and I have seen some which might exceed the volume of a Florence flask. The cervix, when disorganization has commenced, is thickened and elongated; but occasionally this part, from adhesions which the body of the womb has contracted, is so much retracted and fixed, that it cannot be defined nor moved by the finger.

The duration of this malady, I verily believe, is never actually rapid. I have known it continue for several years, but not for a shorter period than some months in any instance. In some cases which I have had under my care, the os and cervix uteri continued for more than a year so solid and unyielding, that it resembled sole leather, or cartilage. The sufferer may be cut off by the gradual undermining of the system from general iritation, excessive discharges of blood and pus, and by peritonitis, which last, however, is not frequent. When a woman with scirrhus uteri has conceived, she is rapidly cut off after delivery.

As the measure of relief to be obtained depends entirely on an early detection of the disease, enough, it is hoped, has already been said to induce the medical attendant to represent, in firm but respectful language, the necessity of effect-

ing this in every suspicious case. Irreparable mischief has often arisen from the reluctance of the sex to grant permission to examine the parts, and from practitioners treating very serious organic lesions, as if they were simply leucorrhœa, or some trifling derangement of the menstrual function.

The diagnosis betwixt this and other conditions which somewhat resemble it, is in most respects, easily established. From mere induration, as the result of congestion or chronic inflammation, we distinguish it by its smaller size, being less florid and vascular, being more indurated and lobular, and by an earlier diminution of its mobility; from indolent tumours by the acute uneasiness; from pregnancy by the state of the general health, the continuance of menstruation, the tardily increased size of the uterus, the sensitiveness of this organ when freely examined, and the absence of the more prominent signs of gestation; from simple ulceration of the cervix uteri by the horrid fœtor of the discharges, the immobility and indurated condition of the organ, and the severity in an advanced stage, of the constitutional disturbance; in syphilitic ulceration, the uterus neither increases in size nor becomes immoveable, the pain is not acute nor the discharge offensive; and we are materially assisted in deciding the nature of the case, by referring to its origin. It would be a useless refinement in diagnosis to attempt drawing a line of demarcation between what has been styled "corroding ulcer" and cancer, since, by those who have recorded their sentiments, it appears that both commence at the same period of life, attack similar subjects, resemble each other in their symptoms and progress, and are alike unmanageable under every kind of treatment.

Our prognosis depends on the stage in which the disease has been detected. It is an opinion very generally, and upon the whole, very properly entertained in this country, that it is incurable; but in this dictum I can only acquiesce to a certain extent. In the very early stages it is as unquestionably true that the malady can be permanently arrested, as it is that we have little in our power when it is in an advanced stage. When it is in a state of incipient scirrhus, much may be done to ameliorate the condition of the sufferer. Cases suddenly supervening to parturition, and those co-existent with cancer of the mammæ, are hopeless; and so are those occurring after abortion, and gonorrhœa; and the former have sometimes a rapidly fatal course.

The morbid appearances may be anticipated. Generally the subject is much emaciated, but occasionally I have been

surprised at the large quantity of adipose matter which was to be seen under the abdominal integuments. Though the ravages of the disease are principally confined to the cervix uteri, yet it is not unusual to find the kidneys, pancreas, spleen, liver, and the lungs even, more or less affected. Though the womb be almost always larger than in the healthy state, yet it is only in some rare instances that this increase exceeds, even by a fourth, the natural size of the organ. A vivid blush generally pervades its external surface. The cancerous degeneration does not *here*, as in other parts of the body, constitute scirrhous masses; on the contrary, it is disseminated among the other tissues of the uterus, which requires to be squeezed, to cause it to appear, when a thick whitish matter transudes the ulcer. Instead of an induration, we sometimes find a mollescence of what remains of the womb. In many instances again, it is intersected by membranous productions, betwixt which are seen numerous small cysts that enlarge as the disease advances; in some rare instances they burst, and contain a vascular production. The cervix may be much ulcerated, or entirely destroyed by that process; or where the sufferer has dragged out a protracted existence, we find merely a small portion of the fundus left in the centre of a large ulcerous excavation. In these cases, the parietes of the rectum are penetrated, and the vagina interspersed with ulcers. Nor does the bladder escape; in some instances I have seen its walls nearly an inch in thickness, its cavity filled with a coagulum of blood, and so contracted that it could not contain more than from two to three ounces of fluid.

Fungus Hæmatodes is so nearly allied, in some respects, to the subject of this section, that I shall briefly notice it here, though it might be thought to merit a distinct consideration. But we know little of its nature, and, generally speaking, as little of any method by which it may be permanently eradicated, wherefore, it is unnecessary in a work in this department, to occupy with it much of the time of the reader. When it commences in the womb, it is marked by irregularities in the periods of recurrence, the duration, and quantity of the catamenia; an acrid, fœtid discharge per vaginam; pain in the loins, sacrum, and hypogastrium, increased while at the *commode*, but more especially by exercise with the pelvic limbs. As these symptoms, however, are characteristic of other uterine diseases, it is impossible to distinguish this affection in its incipient stages; and the more so, since for some time at first, it causes little inconvenience to the patient, nor is the general health much affected. We may find the os

tincæ unusually dilated, soft, and tumid, or one margin of it in this condition while the other feels sound. The uterus gradually enlarges, when one or more firm, elastic tumours, which may be traced to this organ, or to the pubes, are felt through the parietes of the abdomen. At the commencement, the finger, on being withdrawn from the vagina, is not imbued with blood; nor, generally, is there any sanguineous discharge until an ulcer has formed. The fungus may protrude from the outer surface of the uterus into the abdominal cavity, and be followed by inflammation and cohesion of the intestines; it may, by pressure and sloughing, pass through the walls of the abdomen; or it may descend into the vagina, and be attended by a sanguineous, fœtid discharge. We have now hectic fever, strangury, and suppression of urine, from irritation and pressure; and the bladder and rectum are involved in the destruction. From the time the disease is well marked, its course is rapid. Dr Hooper, in his recent work on the morbid anatomy of the uterus, compares fungus hæmatodes to a soft, vascular production, somewhat like a firm coagulum, intermixed with portions of spongy flesh, growing by a large base from the cervix uteri, forming an irregular voluminous tumour, which occupies the upper part of the vagina, and is, in some instances, inclined to the rectum or bladder, both of which it has occasionally penetrated. To the finger, it feels like several polypi united. When cut into, it presents a smooth surface, like that of a clot of blood, or of fibrine. In the work of Madame Boivin, are related three cases of the disease. In all of them, the tumour originated from the cervix and os uteri. The first was an unmarried woman at twenty-six, in whom it commenced after a severe delivery with forceps; the second was forty years old, unmarried, and had for many years been addicted to onanism; and the third, aged thirty, had at one period led an irregular life, but thereafter married, was the mother of several children, of whom she was always delivered with great difficulty, in consequence of unusual projection of the promontory of the sacrum. Nothing but a decidedly unfavourable prognosis can be pronounced. And since the malady must always be well advanced before it is known even to exist, we can do no more than palliate.

The treatment of cancer may be divided into the *preventive*, *radical*, and *palliative*. So long as the disease is in the stage of scirrhus, limited to the os and cervix uteri, without lancinating sensations, incalculable benefit may be expected to accrue from preventive steps. These consist, in cases attended with pelvic uneasiness, in the occasional application of leeches

to the uterus, anus, or vulva, or from cupping upon the sacrum when the patient possesses stamina. As, like other practitioners, I have sometimes experienced difficulty, owing to different positions of the uterus, in commanding a good view of its cervix by the speculum, I would therefore recommend, previously to the use of this last, the introduction into the uterus of a thick, lengthened silver probe, whereby the os and cervix will be fixed and placed in a proper situation for the application of leeches or escharotics to any point where their action may be desirable.

Cicuta in powder, should be given internally to arrest morbid action; and a decoction, prepared from the same drug, thrown into the vagina, three or four times daily, in a tepid state. When there is little, if any pain, Iodine should be preferred to Hemlock. The strictest quiet should be observed by the patient; and irritation, of whatever kind, whether from diet, cordials, or mental disturbance, ought to be avoided. In regulating the bowels, nothing stronger than Ol. Ricin., or the mildest enemata, are to be employed. The Ext. Hyos., Sol. Op. Sedat., or Sol. Mur. Morph., should be ordered at bedtime. Simple as this plan may seem, I have found it so successful in many unequivocal cases, after patients had persevered in it for a limited time, that at the lapse of years, none of them have returned to me: females in easy circumstances, who can indulge in quietude, and rigidly adhere to the other steps recommended, may expect to be benefited.

The radical treatment consists in the removal of the morbid portion only, or of the whole uterus. When the preventive measures are unavailing, this is the next alternative. Nothing could exceed the mania which had been at one period displayed by some of our brethren to obtain opportunities of performing this operation. If it be undertaken while the organ is *in situ*, I hesitate not to declare, that it is one of the most sanguinary and unsuccessful in surgery. The conviction that the sufferer will die in torture, and that, in a few instances at least, life has been *prolonged*, perhaps *saved*, constitute the only justification for resorting to it. But if the viscus be prolapsed, and not affected with scirrhus, or cancer, it may be removed without difficulty or risk. Numerous successful cases are recorded in the periodical press of this country, and of the continent, by such eminent men as Osiander, Graefe, and Siebold of Germany; Dubois, Dupuytren, Recamier, and Lisfranc in France, with Dr Blundell in England, in which a portion, or the whole of the uterus had been extirpated from its natural position. But in some of them, I must express my want of belief, especially in those by Lis-

franc and Osiander.* The latter, in 1801, operated successfully on nine patients, and one of them after three years returned to have the operation performed a second time, which, like the first, was successful! All we can say is, that such success could scarcely be looked for, even after the amputation of as many extremities. Dr Souter relates an instance, in which, after the most horrific proceedings, the woman recovered in four weeks; but this calls to our remembrance that every general rule has its exceptions. It is not unworthy of notice, that at least two of those in whose hands the operation has been successful, as Dr Blundell and M. Recamier, have since written against it.

As it is probable that cancer, whether it attack the mamma or the uterus, is the same disease, and that, if local in the first instance, it in time becomes a general affection, the success of the operation therefore, whether on a portion or on the whole uterus, must be problematical, even when early performed; and most generally useless when done at a late period. It may be effected in two ways; *first*, through the parietes of the abdomen; and, *secondly*, per vaginam. From the exposure of the abdominal cavity, it is not very likely any one will gain laurels by the first method, though, apparently, this operation would seem to be more easy. Many successful examples of excision of prolapsed uterus are recorded. Professor Wrisberg relates an extraordinary one, in which an ignorant midwife cut off, with a common bread-knife, the prolapsed portion of a healthy womb. The same operation is said by Sue to have been performed in 1575, by Lacutus Lusitanus. When attempted, the earlier after the existence of the disease is ascertained, the better. And as the success on the prolapsed womb has been very general, an attempt should previously be made to induce this state by a cathartic every alternate day, the hip warm-bath twice daily, and by frequent voluntary straining efforts. This is surely preferable to Osiander's barbarous method, viz. transfixing the cervix uteri with ligatures, to draw down the organ by main force to a state of procidentia, and the morbid portion, or the whole womb, insulated by a bistoury. I have been informed by several of my pupils who witnessed the excision of portions of the uterus at Paris, that so little pain attended the operation, that the individual was scarcely sensible of its performance. To moderate hæmorrhage, a piece of sponge immersed in Acetous Acid, a strong Solution of Alum, of Acetate of Lead, or in one part of Pyroligneous Acid, and two of

* Edin. Med. Surg. Jour. vol. xii. p. 286. Ibid. vol. xxii. p. 173.

water, should be firmly pressed against the top of the vagina: antiphlogistic regimen, scrupulous attention to cleanliness, and strict quiet, should be rigidly observed. A powerful dose of the Sedative Solution of Opium must be given after the operation. The principal objects are, to avoid entering the peritonæal sac, or penetrating the bladder. Fatal event is owing to effusion of blood into the abdomen, of which I have seen a patient die in seventeen hours and a half after she had been operated on. Her appetite was voracious for some hours before death. Other women die from loss of blood and inflammation, in less than twenty-four hours after the removal of the uterus, as happened in one instance which I witnessed.

The *palliative treatment* is to be adopted when all prospects of relieving the sufferer by operation, are at an end. It consists in the occasional exhibition of Opium, to allay vomiting and excessive pain; of injections, *per vaginam*, of a concentrated Decoction of Poppy-Heads; or of the Chloro-Sodiac of Labarraque, which is in general use in Paris, and which is highly efficient in removing all unpleasant effluvia from the vagina. Iodine, Arsenic, and Caustic have been employed among the palliative remedies, and from the latter in solution, Dr Churchill states that a patient derives great benefit, in allaying pain in the tract of the sciatic nerve.

Sect. XXXV.—*Diseases of the Uterine Appendages.*

The *Fallopian Tubes* are liable to the same morbid changes as the uterus, from their intimate connection with this latter organ, as well as from their continuity of structure; but they may be affected independently of it, though from their situation, their diseases are generally confounded with those of the uterus or ovaries. When they are affected with *acute inflammation*, we have deep-seated acute pain in one or both iliac regions, frequently darting towards the uterus, extending into the loins and along the thighs, accompanied by acceleration of pulse, increased heat of skin, and thirst, but without local swelling.

Chronic inflammation may also affect the tubes, from their being occasionally found greatly distended by a greenish serous fluid, as in a preparation possessed by the author, their channel being obliterated, or their fimbriæ cohering to some adjoining structure, as may be observed in females who have died when somewhat advanced in life, or in veteran Cyprians. They may also be the seat of malignant diseases in consequence of their extension from the uterus or ovaries, and they

have in some rare instances been found in intimate connection with indolent growths; and in other cases ruptured, unconnected with gestation. The tubes must also be subject to malposition under similar circumstances with the uterus. Acute diseases of the Fallopian tubes may *terminate* in peritonitis or metritis, and thus destroy the patient.

Post-mortem examinations, besides some of the conditions now referred to, reveal the various lesions of structure induced by inflammation, as vascular turgescence, effusions of lymph, abscess, pus, incrassation, and mollescence of their parietes.

The *Ovaries*, though differing in structure from the uterus, are liable to similar morbid changes with it, as inflammation acute and chronic, and malignant disease; but as they are not so much exposed to the causes, neither are they so subject to these mutations as the latter organ. Generally acute inflammation of the ovaries is an extension of this disease from some adjoining structure; but they are in an especial manner subject to chronic inflammation without any neighbouring organ being similarly affected. Reasoning from analogy, there are two periods at which acute inflammation is liable to arise, viz. when these organs are likely to be in the greatest state of excitement, as when puberty is about to be established; and after the first prolific sexual intercourse. Independently of the extension of inflammation from some adjoining viscus, disease may be the result of blows, injuries during parturition, premature exposure to cold after the performance of this function, and the abrupt suppression of the lochia, catamenia, or leucorrhœa.

The *symptoms*, except when the ovaria alone are affected with disease, are almost certain of being invariably confounded with those of uterine derangement; but when the uterus is free, the patient is sure to mention a deep-seated pain in either iliac region; the uneasiness, from being at first obtuse and circumscribed, becomes acute and diffused as the excitement extends to the peritonæum; a defined swelling is detected in the affected region, or by an examination per rectum, in which direction the enlarged organ is more easily reached than along the vagina; and these evidences of disease are accompanied by the usual phenomena of febrile excitement.

Chronic inflammation of these organs is not always a sequence, but very frequently indeed an incipient state of one of the ovarian tissues. Here, as in the acute variety, we have, when the uterus is not involved, an obtuse, circumscribed pain, limited to either iliac region, with a definable swelling which can be traced either through the abdominal parietes

or per rectum, unaccompanied, however, by such marked constitutional disturbance as attends acute ovaritis. The *prognosis* in acute ovaritis must be very guarded, for the result may be as serious as in inflammation of any viscus of the abdominal cavity; but the chronic variety neither terminates so rapidly, nor is it so formidable as the preceding, since individuals have been thus affected for a number of years with scarcely any inconvenience. The *termination* may be in resolution, or in abscess, which may discharge its contents into the peritonæal sac, most frequently per rectum, but less so by the vagina, or the urethra. *Dissection* displays the usual effects of inflammation, as vascular turgescence, enlargement, and induration ; or abscess and gangrene, with such complete disorganization of its tissues, that scarcely a vestige of the organ can be discovered.

The Broad and Round Ligaments may be the seat of inflammation, either separately, or jointly, with the uterus. This is known by pain centred in either iliac region, darting into the hypogastrium, and extending along the tract of the latter into the groin. Sometimes *the vagina* is similarly affected, and from it, the excitement may extend to the uterus, and *vice versa;* or the canal may be affected when the womb is healthy. The author has oftener than once been consulted by the mothers of young ladies recently married, where inflammation of this organ seemed to have arisen from a delicate cause. There was excessive pain along the whole canal, resembling the pricking of pins, returning by paroxysms, unusual heat, a greenish viscid discharge from the passage, frequent micturition, and much uneasiness in the extremity of the rectum.

In *the treatment* of inflammation of the Fallopian tubes, ovaries, ligaments, and vagina, the steps to be adopted must depend upon the habit of the patient, the symptoms, variety, and the stage in which we are consulted. Acute symptoms in a vigorous state of the subject must be subjected to the most active general and local *antiphlogistic measures;* but under opposite circumstances, we must be satisfied with an energetic local treatment alone, such as leeching and blistering. Spare, bland diet, quietude, enemata, hip warm-baths, and the frequent injection of warm water into the rectum and vagina, are to be insisted on. In protracted discharges from the bursting of an abscess in the directions referred to, strict attention to cleanliness must be observed, with tonics, cordials, generous diet, and a country residence; and if the system be not too spare or irritable, while the reduction of the swelling or the diminution of the discharge is tardy, an al-

terative course, Pil. Hyd., or the use of Iodine may be required.

Encysted Dropsy of the Ovarium.—The effusion, here, instead of resembling that of other dropsies, is generally of a *gelatinous consistence*, and *encysted*. The ovary, independently of a peritonæal coat, has another proper to itself, within which it consists of vesicles, and cellular tissue. As the organ is thus constituted, we are in some measure enabled to account for its being so frequently the seat of this affection, which has been observed to prefer parts abundantly cellular, to other structures. The *middle periods of life* are those at which this curious affection generally appears, not so frequently after the cessation of the catamenia, while persons of advanced years would seem to be secure from it. I have witnessed it in two unmarried ladies, the one twenty, the other twenty-one years of age, the younger had been repeatedly tapped,—and when I visited her, the abdomen was as large as if the uterus contained twins, and she died shortly afterwards. The second patient died from hepatitis, her left ovarium was about double the size of a walnut, and in its centre there was a cicatrice such as might have resulted from the development and bursting through the peritonæum, of a Graafian vesicle. This lady had long suffered from the effects of disappointment in a matrimonial settlement. The *individuals most subject to* the complaint, are those whose menses are irregular, have been entirely suspended at an early period of life, who have suffered from domestic grievances, and have had repeated abortions; but cases have occurred in which none of these conditions could be traced. Matrons are more liable to it than those who have not had a family; and the latter are rarely affected until well advanced in years. A strumous habit has been enumerated among the predisposing causes; and I was once informed by a pupil, of a family of nine daughters, all of whom had ovarian disease.

The exciting causes are very obscure; among the number, blows upon the region of the ovary, uterine irritation from venereal excitement, and premature exposure to cold after parturition, have been mentioned. Indeed the disease is not a rare one; and though I have been consulted in cases where it could be clearly traced to one or other of the causes now particularized, yet in others they could not be elicited. The fairest view which can be adopted regarding it is, that it consists in chronic inflammation, commencing in the inner structures of the organ, and, accordingly, it is now considered by those who have investigated the subject, as Nauche, Boivin, Dugés, Blundell, and Seymour, to originate in disease of the

Graafian vesicle—an opinion supported by one of the foregoing observations. An extension of this morbid action to the peritonæal covering of the ovary, may give rise to ordinary dropsy. The author has seen several cases attended with effusion into the peritonæal sac.

In regard to the symptoms, for a long time before any thing can be distinguished, the woman has an uncomfortable feeling, with obtuse pain in either iliac region, and a sensation of weight in the pelvis. In other instances, the pain is acute; and the mammæ are similarly affected, enlarged, and contain milk. As nothing can be felt, her medical attendant supposes her complaints to be hysterical; and he tranquillizes her mind with some tale from day to day, until a tumour can be defined in either side, above the brim. This may not exceed the size of a hen or goose egg; and it may remain stationary for many years. Generally, one organ only is affected, but occasionally both; and the left oftener than the right. An individual is known to the author, whose left ovary has been in this condition from 1815, since which she has had four children, and shortly after her last delivery the right organ began to enlarge, and, though both are now the size of a goose egg, the general health of this woman continues good. It is worthy of notice, as showing the influence of these organs over the function of menstruation, that this secretion discontinued after the second ovary began to enlarge, though this person was only 42 years of age at the time. Except the example to which I alluded at the commencement of this section, every one of a number of cases which I have met with, has been slow in its progress; and I believe this accords with the experience of practitioners in general. When as large as the cranium of a fœtus even, it occasions little inconvenience. It is perceived to float freely in the abdomen, changing its situation as the woman alters her posture. The position of the tumour does not determine its nature, especially after it has attained considerable size. Of this an estimate is to be formed by the early history of the case, the presence of fluctuation, the position of the womb, and the general health. Until the growth is much enlarged, no fluctuation can be distinguished, since its contents are at first limited, gelatinous, and enclosed in thick cysts. The uterus is either drawn above the brim, or forced lower into the pelvis. If an examination be made *per vaginam*, the tumour may be felt in the pelvis, and, so long as it remains there, it causes disturbance of the organs subjected to its pressure; but whenever it ascends upon the brim these complaints are mitigated, and the health of the patient is much improved.

The catamenia may or may not continue, except when both organs are affected, when the secretion ceases, as in the foregoing observation. Little change takes place in the general health, till the ovary is much enlarged. And as to the history of the disease, the principal object of inquiry is the point in which the tumour was first felt. It is only in an early stage that any determinate knowledge can be acquired regarding it; for after occupying nearly the whole of the abdomen, it is difficult to say what viscus is involved, since the spleen and the uterus, as well as the ovary, may become much enlarged, before any serious constitutional derangement is produced.

A remarkable peculiarity of this malady is, that its growth is from time to time suspended for years, without any known cause, and again accelerated. Ultimately the peritonæal tunic is involved, and from this period, the tumour rapidly increases in size. Though previously the disease interfered very little with the general health, yet now many troublesome symptoms arise, dependent on sympathy, from the mechanical influence of the enlarged organ. The patient is breathless and dyspeptic; there is obstinate constipation, piles, strangury, and frequent micturition, incontinence of urine, with œdema of the pelvic limbs from interrupted circulation.

In the diagnosis, there are some important points for strict attention. Betwixt it and ascites, the distinction may be easily drawn to an advanced stage; but after the diseased organ has acquired a large development, this cannot be readily accomplished, unless the case be minutely traced to its origin. In common dropsy, there is impaired health, diminished secretion of urine, disturbed rest, and œdema of the pelvic limbs, before the complaint has, apparently, made much progress. In ovarian disease we have none of these until the abdomen has acquired an enormous size; the patient enjoys a large share of good health to a late period. To draw a line of demarcation between diseased ovarium and pregnancy is difficult; and the most extraordinary mistakes have been committed in the attempt. Some years ago, I was engaged to attend the lady of a military officer, who, during the preceding gestation, had been considered as labouring under ovarian disease, for which, in the words of her husband, *she had been unmercifully salivated, oftener than once, made to swallow such a quantity of the Solution of Muriate of Lime, as would have filled a fish pond;* but the fœtus proved a true son of Mars, for he would not quit his fortress until the proper period. Some time afterwards, I was requested to visit a

woman who had, for many years, been a gay courtesan. Previously to my having seen her, she had consulted two veteran practitioners, the one a Fellow of the College of Physicians, and the other a fellow of no college, both of whom declared her to be pregnant; but this the nymph scouted, and considered an insult. Thereafter she was visited by two surgeons, each of whom pushed a trocar into her abdomen, the one upon the supposition that she was dropsical, and the other from the idea that she had diseased ovary. She died within a year after the last operation, and dissection proved that there was neither a child, dropsy, nor diseased ovarium, but a spleen fully as large as a fœtus. When a practitioner is called to an individual in whom he suspects pregnancy, but whom, from her being unmarried, he dare not pronounce to be with child, a great object is to gain time, until she has completed five months, when, if no fœtal movement, nor the other phenomena of gestation can be discovered, the idea of her being pregnant may be relinquished. From *retroversio uteri* it may be known by its tardy development, the functions of the bladder and bowels being for a long time scarcely interrupted, and the mildness of the other symptoms; from *extra uterine-gestation* by the unequivocal signs of pregnancy being wanting; and from *malignant disease* by the absence of those appearances of the features indicative of serious organic lesion, the general health being little affected, and immunity from acute pain.

The prognosis, so long as the disease continues stationary, may be favourable; for in this state, if females can be prevailed upon to follow retired, tranquil habits, by withdrawing from the turmoil of a town life, they may live, and even enjoy a considerable share of good health, as long with, as without this malady. But whenever there is such an acceleration of the complaint, as to require the fluid to be evacuated, it is sure, in a large majority of instances, to prove fatal, though, generally, this event is protracted. I knew one poor woman, who, in the course of ten years, had been tapped 133 times. The duration of the disease is extremely various; some persons have been known to be thus affected for more than thirty years. And from what has already been stated, the individual may conceive when only one of the organs is affected.

The *termination*, most frequently, after numerous tappings, is in general peritonitis and death; or the parietes of the cyst may burst, its contents escape into the peritonæal sac, and destroy the patient by the induction of inflammation. Such cases terminate, however, sometimes more favourably;

first, by the cohesion of the cyst with some portion of intestine, vagina, or bladder, and opening into one of these outlets, either with temporary or permanent relief; or, *secondly*, by cohering to the abdominal parietes, and bursting through these externally, either at the umbilicus or some other point, and leaving the patient with a permanent fistula.

In autopsies, a great variety may be observed. The whole ovary, in some rare instances, forms but one common sac; in others, it is divided into a number of cysts of varied size, some of them not so large as grapes, but of an ovoid figure; others equal to the bladder of a sheep, or to that of an ox. A great diversity is remarked in the quantity and consistence of their contents, which may vary from a few ounces to several gallons; it may be thin, or so viscid in consistence that it will not flow through a canula; but, except when copious, it is rarely very fluid. In colour it may be limpid, greenish, brownish, or from being mixed with blood, appear sanguineous: generally it is inodorous, but occasionally offensive. They sometimes contain structures resembling those of bone, teeth, hair, and fleshy substances; which Dr Churchill ingeniously supposes to be the result of impregnation, and partial development of a fœtus. The thickness of the walls of the cysts varies from that of a common membrane, to that of the abdominal parietes, and are said to consist of three layers—the external and internal serous, and the intermediate fibrous. Their inner surface is smooth or knotted. In colour these walls are generally pale, like coagulated lymph, occasionally sanguineous, in some rare instances so very vascular, as to afford a sound similar to the placental;* and in texture soft, or of a scirrhous hardness. Besides the hydatids which are found in the interior, myriads of these, diminutive in size, adhere to the outer surface of the ovary. The volume which this organ has been known to acquire, is altogether marvellous. Some years ago, I witnessed one, which, from its appearance, could certainly have contained more than six gallons; but this is trifling compared to two cases related in the 14th and 15th vols., Abridg. Edit. Phil. Trans. From the first, by 80 tappings, in the course of 25 years, 829 gallons were abstracted; and at one of these operations, 73 pints. The second was punctured 155 times, from 27th June 1774 to 14th May 1778, in which time 3720 pints were removed. The largest quantity discharged at one operation was 30 pints. Their weight also has in some instances exceeded belief; from seven to ten pounds is not unusual, but Haller in his Dispu-

* Churchill's Diseases of Females, p. 364.

tationes Medicæ, tom. iv. p. 449, thus expresses himself:—"*Monstrosum hoc ovarium e sede sua exemtum et cum utero recissum statera ponderatum* 100 *libras cum dimidia æquaverat.*"

Scirrhus of the Ovarium.—This is not by any means so rare an affection as some writers have stated. I have not only seen this organ frequently much indurated, but repeatedly in a state of ulceration. Its causes, when they can be traced, are generally the same as those of dropsy of the ovarium,—and in most respects they are similar in their symptoms. In a few particulars, however, there is a marked difference. Scirrhus is slower in its progress; does not frequently attain so great a size; but is attended with more pain than dropsy of the organ. As to volume, there are cases recorded, in which it weighed from three to seven pounds; and one by Morgagni, lib. iii. epist. 39, which weighed 24 pounds. Few of those which I have seen, however, exceeded the size of a pigeon's egg. Until ulceration commences, it seldom causes much inconvenience to the patient; but after this change, she has acute lancinating pains. It is impossible to determine the presence of this affection, unless a tumour can be felt, and it be attended with much pain. In regard to their mode of termination, they may destroy the sufferer in consequence of the irritation arising simply from their diseased condition, or from their pressure on other organs. Sometimes they cohere to the intestines, or to the abdominal parietes, which ulcerate, and a breach is thus ultimately effected for the exit of the generated matter.

Fungus Hæmatodes has, in a few instances, been discovered in this organ. The late Dr Baillie, in his Morbid Anatomy, describes one case, and Mr Wardrop another. In the former of these, the morbid organ was large, and when examined, presented a smooth, uniform texture. It was converted into pulpy matter, and interspersed with cells. The ovary, in the second instance also, was much enlarged; and when examined, was found to consist of different lobes, separated from each other by thin cellular septa. These different divisions varied in colour and texture; some resembled brain, others were vascular, and a third contained cells filled with blood. The presence of this affection cannot be determined during life.

The treatment of encysted dropsy and scirrhus of the ovary too often reflects but little credit on the practitioner; and this is always the case in so far as the different varieties of cancer are concerned. In ovarian dropsy, we must *first* endeavour to arrest the progress of the disease; *secondly*, when this is

not successful, we have to determine the propriety of removing the tumour; and, *thirdly*, if there be no encouragement for this bold practice, we must rest satisfied with palliating. *To fulfil the first indication*, the patient should be strictly enjoined to observe retired habits, to relinquish visiting, late hours, nursing, fatigue, and causes which may give rise to mental or uterine irritation. No stronger exercise should be indulged in than gentle walking. The individual ought to pass the greater portion of her time in retirement. Whatever has a tendency to occasion premature suppression of the menses, more especially damp shoes or stockings, and deficiency of warm clothing for the pelvic limbs, must be guarded against. Leeches are occasionally to be employed, whether there be acute pain or not. In all cases where a woman has a constant gnawing pain in the groin, even though a tumour cannot be traced, the local abstraction of blood from time to time, and small blisters, will be found highly beneficial, followed up by warm emollient cataplasms. Iodine in form of frictions, is a remedy of the greatest value in such cases. I have in several instances known very large ovarian tumours disappear under its influence. Patting, tickling, or the occasional application of the hair brush two or three times daily, over the diseased organ, is a plan, though apparantly trifling, which has been known to completely arrest the progress of many cases of long standing. In one instance which, for the last 27 years, has made little progress, I ascribe the suspension mainly to this practice. The solution of the Muriate of Lime has been in high estimation with some practitioners from its supposed influence in arresting the disease. We are to regulate the bowels by enemata, or Castor Oil, while every aperient which has a tendency to occasion irritation, more especially of the rectum, is carefully to be avoided. Finally, the mildest farinaceous diet is to be recommended. I cannot speak with too much confidence of the beneficial effects of a careful and persevering trial of the foregoing steps.

When the disease gains ground in despite of the plan which has now been detailed, we have next to consider the propriety of extirpation. On this point much contrariety of opinion has existed, but it is important to bear in mind, that this practice is opposed principally by those whose information has been derived from reading; while such of our brethren as have dispassionately considered the subject, and witnessed the performance of the operation, maintain, that under particular circumstances it is deserving of being adopted. I witnessed the section of the abdominal parietes in five out of six instances in which it was performed, and three

of this number recovered; and of those who were unfortunate, one was a habitual drunkard, and a second an opium eater. These, therefore, should not, and would not have been operated on, had their habits been known, as they were not proper subjects for operation; so that, fairly speaking, there was but one unsuccessful case in the six. And if the British periodical press be consulted, it will be seen, that of the whole number who have since been operated on, more than three to one have recovered. Wherefore, in cases favourable for adopting this line of practice, and in which relief is urgently called for, it seems to me that the extirpation of the diseased ovary is as justifiable as the removal of a portion of the upper or lower jaw, or amputation at the hip-joint,—operations which no surgeon hesitates to undertake. Nor is it more unnatural than the abstraction of water from the brain, which has been successfully resorted to by some of the most judicious men in the profession. Though it may thus appear, that I advocate the expedient in question, I wish to be distinctly understood as considering it fraught with danger: it should not be attempted without consultation with men of experience; nor without accordance in their opinions that the tumour is ovarian, that it is increasing in size, and that its connections are neither numerous nor intimate with surrounding parts. We must particularly determine, before this mode of relief can be contemplated, the point at which the tumour was first felt, and its present degree of mobility. If very moveable, the constitution sound, the habit spare, and the mind resolute, we may be sanguine of success. Ascites, from what I have witnessed, is not a discouraging circumstance, if the general health, in other respects, be good. But the operation should not be attempted in a woman of unsound constitution, nor in one whose habits have undermined the system. In performing it, the same steps, in many respects, as have been recommended in the Cæsarean section, are to be followed here, more especially in so far as heating the apartment, and dividing the parietes of the abdomen are concerned: the after treatment should also be the same. Some subsidiary methods of operating have been recommended in these cases; *first*, drawing a seton through the tumour; *secondly*, puncturing it, injecting liquids into it, and preventing the closure of the opening by a tent, until the sac has sloughed away. Littre, Le Dran, Houston, and Voison, permanently relieved individuals by the latter method. In the cases of Le Dran and Voison, after a small incision had been made into the ovary, a fistulous opening continued to discharge for many months. Morgagni, whose authority cannot be doubted,

after the removal of the contents of the tumour, speaks of injecting it. In some instances it coheres to the abdominal parietes, bursts and discharges its contents externally. Chomel relates a case in which it cohered to, and burst through, the abdominal parietes, and in which he threw an injection into the sac, two or three times daily for three weeks, and the woman recovered. In 1826, I was requested to visit a female in this city, in whom some time previously a tumour opened at the umbilicus, and constantly discharged dark fœtid matter, of which there was an increased quantity during laborious occupation, warm weather, and the monthly indispositions, but her general health was good. The contents of these morbid growths, as already mentioned, are sometimes so viscid as to require a large exit, for one formed by an ordinary trocar has often proved insufficient: we should be aware that the practice has, in some instances, been succeeded by fatal consequences from inflammation, and more especially where the sac has been injected. It is supposed that the plan now spoken of is unsafe, lest some viscus be interposed between the uterus and the abdominal parietes, but I have never witnessed the like in autopsies at the full time. Hence, when the removal of the tumour, from any cause, cannot be contemplated, we should maturely consider the propriety of adopting this practice. In one of the cases which I witnessed, and where, after the abdomen had been opened, it was deemed unadvisable to remove the morbid growth in consequence of its vascularity and extensive connections, a seton was inserted pretty deeply through the tumour, and in a few months, its size was reduced nearly two-thirds.

The palliative plan must be resorted to, when, from any cause, as an impaired state of health, or an immense collection of fluid, the foregoing active measures cannot be adopted. Tapping is the principal palliative remedy, which, though of temporary benefit, yet affords incredible relief to the sufferer, from excessive dyspnœa, and other distressing sympathetic affections. But though its effects be so gratifying to the patient, yet it should always be the *last alternative*, since one operation paves the way for many others in quick succession, by the irritation thus produced causing a rapid renewal of the effusion. If fluctuation be distinctly felt *per vaginam*, I cannot help thinking, that it would be better to open the sac in this direction, than through the parietes of the abdomen; and as the fluid is generally contained in many distinct cysts, when, by one puncture, the tumefaction is not much reduced in volume, several openings in different directions, may be required. When the contents are not evacuated by this expe-

dient, we may presume them to be preternaturally viscid, and to require the aperture to be enlarged. Where paracentesis has been performed at a convenient point, an adequate number of leeches should be applied around the wound, to subdue irritation, and prevent the effusion being so rapidly renewed. By Mr Abernethy, blisters are highly spoken of, after tapping; as also confinement to the recumbent posture. Diuretics have not the slightest influence in retarding the disease at any period.

No other treatment than a palliative one, can be adopted in cases of cancer of the ovary, whether medullary or otherwise, since, before its existence is known, the disease is almost always too far advanced, to be benefited by any kind of operation.

Sect. XXXVI.—*Osteomalacia.*

As this disease occurs most frequently in women who have borne children, it was at one time thought to be peculiar to them, but it may be met with, not only in females who have never been pregnant, but even in men, although examples of it in the latter are rare. It bears a strong analogy to rachitis; unlike that affection, however, it does not appear until some time after puberty, and it is this circumstance chiefly which causes the pelves suffering from these diseases, to assume their characteristic distortions, because at the period the pelvis is attacked in the child with rachitis, it is in a very different condition from that of the adult when malacosteon commences; for those parts of the pelvis are the weakest in early life, which are the strongest in maturer years. Thus, in the infant pelvis, the points of junction at the acetabula of the three bones composing the ossa innominata, are its weakest parts; if, therefore, there be spontaneous curvature of the bones, or undue action of the muscles, the pelvis will yield at those points in the direction in which the bones are drawn by the muscles; thus the anterior wall will approach the posterior, and hence we will have the well known characteristics of the rachitic pelvis,—a diminished conjugate, with increased tranverse diameter at the brim, and widening of the pubic arch. In the adult, on the contrary, the point where the lines of junction were placed has become strong and consolidated, and, therefore, the ilia and pubic bones being the weakest, are the first to undergo those remarkable distortions which have already been fully described.* It is not, therefore, a difference in

* Vid. p. 297.

the disease that gives rise to the varieties of deformity characteristic of these affections, but it is the difference in the state of the pelvis at the periods at which it suffers from them. Like rachitis, malacosteon attacks solely individuals of a scrofulous diathesis, is found only in cold damp climates, and chiefly among those persons whose health is vitiated by the effects of bad diet. One of the earliest symptoms of mollities ossium is, that the patient passes urine frequently and copiously; this fluid, when tested, is found to possess a powerfully acid reaction, and deposits a copious sediment of phosphate of lime; the person suffers severely from acute pain, chiefly in the loins and limbs, very much resembling that of rheumatism, and probably frequently mistaken for it; the bones then become soft, and bend in various directions, especially the spine, ribs, and pelvis, the extremities being in general the last affected. And it is curious that, notwithstanding their extreme softness, they are exceedingly liable to fracture on the slightest exertion. These fractures heal with great difficulty, and the broken ends of the bone are reunited generally by cartilage, very rarely by osseous tissue. The patient now suffers severely from pain on moving, and therefore confines herself to bed. In consequence of the curvature of the bones, the body becomes diminished in stature, the cavities of the thorax, abdomen, and pelvis contracted, and the functions of many organs impeded, hence ensue difficulty of breathing, constipation, and obstruction to parturition. Various theories have been brought forward as to the cause of malacosteon, such as a "viscidity of the humours," an excess of acid formed in the digestive canal dissolving the phosphate of lime in the bones, or the digestion being unable to procure from the ingesta, a sufficiency of phosphate of lime to supply the osseous tissue. By Jaeger, Sachs, and others who have lately investigated this disease, it is believed to depend on a disproportion, or want of harmony between the functions of the cerebro-spinal and ganglionic systems, the one being in a state of excitement and the other in a state of torpor, thereby inducing a disorder of the nutritive function, by which nutrition is converted into merely an inferior vegetative process, incapable of producing the higher varieties of organised matter. That the disease is caused by a disturbed condition of the process of nutrition, influenced by external circumstances, there can be no doubt; but a sufficient proof of a want of harmony between the functions of the different parts of the nervous system, has not been supplied. According to Lobstein, the disease arises from faulty nutrition, and the same author

states, that there is no absolute difference between it and rachitis. As scoliosis of the spine has been proved, by Stromeyer, to arise in some instances from paralysis of certain nerves, arguing by analogy, the hypothesis has been brought forward by Wallach, that deformity of the pelvis, from malacosteon, may be induced by paralysis of the nervous trunks passing through its cavity, consequent upon injury inflicted on them by the passage of the fœtal head.

For the treatment of this affection many various means have been recommended. The first and most important of these is the regulation of diet, which ought to be nutritive, and such as can be easily digested; while the patient should be removed to a dry and warm atmosphere; the astringent tonics, as bark and acorn coffee, have been used with benefit, likewise the preparations of iron, especially Limat. Fer., and the long continued use of Ol. Jecor. Asel. Besides these, the bowels must be regulated by means of an occasional purgative, and as they are generally torpid, the drastics are preferable; and the use of the warm bath has been found to relieve local pains. The only topical treatment necessary, will be mechanical means, to prevent if possible the curvature of the spine or extremities.

On examination of the bones which have been affected with malacosteon, they are found thickened, their cellular texture increased in extent, the cells themselves considerably enlarged, containing a gelatinous, greasy, reddish-yellow matter, which also fills the contracted medullary canal of the long bones, and the outer shell of the bone is much attenuated. Malacosteon is extremely rare even in those countries where external circumstances appear most favourable to its production; the author saw one example of it in a young man about twenty years of age, who, during three months he was under his observation, did not appear to be in the least benefited by any of the modes of treatment above mentioned, as at the end of that period the pains in the loins and extremities, especially in the arms, continued undiminished, and the distortion of the body and limbs was gradually increasing.

CHAPTER III.

SIGNS AND PATHOLOGY OF THE GRAVID STATE.

The evidences of conception are very obscure in its primary stages, and to a practitioner who does not make midwifery his particular study, the difficulty, in many cases, of determining the presence of gestation, even where it is far advanced, has been found as perplexing as the knowledge of it is important. Instances are not wanting, of even veteran accoucheurs having given decisions on this head, which were remarkable only for their error and fatal tendency, and which exposed their authors to the sarcasms of their professional brethren, or to the severe and merited censure of the party concerned. How often has pregnancy been confounded with ascites, and the patient been doomed to submit to an operation which might involve her own life, and that of the fœtus *in utero!* How often, on the other hand, have females who were in reality affected with ascites, been pronounced pregnant, to the outrage of their feelings, and injury of their moral character! And what is infinitely more painful, are there not examples recorded, where the last sentence of the law has been suffered to take effect on pregnant females, owing to the ignorance of those appointed to determine their situation; and thus infants have fallen victims to punishment, who were not sharers in guilt;* and even the abdomen of the living female has been laid open to emancipate an infant, and no fœtus found. It may assist the practitioner in his decisions, to be informed by what description of persons he is most likely to be importuned. They may be divided into three classes; *first*, Those who have no right to be pregnant; *secondly*, Those who have a right, but cannot in reality expect to be in this way; and, *thirdly*, Females who not only have a right, but are most anxious, and may become the mothers of families. Under the first head may be included the single, and occasionally also the married who may have been

* In the second vol. Foderè Méd. Légale, p. 444, a case is related on the authority of M. Deveaux, where a woman who was to be executed, declared herself pregnant. A jury of three midwives were ordered to determine her situation, and they having reported that she was not with child, the sentence was carried into effect. On dissection, however, a fœtus of the fourth month was found *in utero*. The midwives were severely reprimanded by the magistrate.

guilty of incontinence in the absence of their husbands; both of whom have a particular interest in knowing whether they are pregnant or not, that they may adopt means to procure abortion, and save their character. In the second class, we include coquettes who feign gestation, as a defence against old age. In this description, we may also include married ladies, in whom the catamenia are about to take their final leave, or have actually done so, and who are building hopes on this latter circumstance, of becoming mothers, which it is too evident can never be realized. The third order includes all those females who have been long married, without having exhibited any evidence of fecundity, and who, with a view to restore domestic happiness, which may have been disturbed by this cause, are most anxious to become mothers.

With few exceptions, the symptoms of pregnancy are equivocal. They are constitutional and local. We shall first consider the former, and such as are developed in the early months. There is not an organ, the stomach excepted, which possesses a more powerful influence over every function of the animal economy, than the uterus; consequently, the constitutional symptoms of pregnancy are extremely various; for not only the corporeal, but the intellectual functions also, participate in the derangement produced by the important changes which are going forward, and which induce a state of general irritability. On this, as on other occasions, individuals vary in their sufferings; but it may generally be remarked, that those who are in this condition for the first time, as well as females who have enjoyed but an indifferent state of health previous to their becoming pregnant, pass through gestation with the least local or general derangement. I once had occasion to be consulted in the case of a patient, who was seldom if ever in good health, except when pregnant. Females, who, previous to their entering the matrimonial life, were great martyrs to dysmenorrhœa, scarcely suffer any thing from the diseases incident to the gravid state.

Until after a woman has been one or two months obstructed, there is rarely any perceptible change in the general health. Within the first ten or fourteen days after conception, I have, in a few instances, known syncope suddenly supervene, without any apparent cause; but such a phenomenon is more common in the later than the early months. In occasional instances, the nervous system acquires an extraordinary degree of susceptibility, from within a few days of the date of conception. The slightest noise, when brought about suddenly or unexpectedly, alarms such patients; an

approach even to unkindness, whether in word or action, produces mental distress; opposition to their will, however trivial, excites peevishness; and if there be some who are more cheerful, and enjoy better health while pregnant, there are others, who, from the most obstinate despondency and hypochrondriacism, are miserable to themselves, and render those around them unhappy. Such is the influence of the gravid state on the intellectual functions, that females who, when not in this condition, are the delight of society, become so peevish and irritable while pregnant, that their company is as much shunned as it was formerly courted. In most instances, the digestive organs participate more or less in the general derangement, from an early period of gestation. When an individual has been some little time obstructed she experiences a feeling of corporeal lassitude, from the time of rising from bed until noon, when this sensation gradually wears off. In a few days this is followed by ptyalism, dyspepsia, nausea, and soon afterwards by vomiting. This latter symptom is sometimes very severe, not only whenever the patient lifts her head from the pillow in the morning, but during the whole fore part of the day, when it gradually degenerates into excessive languor and listlessness. The vomiting has sometimes been so severe and incessant, as to lead to considerable apprehension lest the patient might die of consequent inanition. In some instances there are no dyspeptic symptoms at any period of gestation; on the contrary, I have known females have rather a voracious appetite. The nausea and vomiting, though generally diseases of the early, are sometimes present only in the latter months; while in other cases, they are not observed at any time. Sometimes there is the most extraordinary perversion of the natural appetite. Patients, while in this state, have been known not only to express a strong desire for, but actually to have swallowed articles which do not contain a particle of nourishment, as chalk, putty, cinders, &c.

The circulating system presents some disturbance in the early months: frequently patients complain of palpitations, and the blood, when drawn, generally presents the buffy coat, from an increase in the quantity of fibrine,—the effect of augmented irritability.

Slight derangement of the urinary organs occurs in the early months. The patient has frequent desire to evacuate the bladder, partly from this viscus partaking of the prevailing irritation, and partly also from its expansion being limited by the presence of the enlarged uterus.

Some marked changes are observed in the countenance.

The eyes exhibit a degree of languor, and are surrounded by an areola of a purple colour. The nose appears sharper and more prominent, and the mouth larger than usual, which must be ascribed to loss of substance. Betwixt the uterine system and mammæ, a powerful sympathy exists, but this connexion is not so obvious at all periods of pregnancy. In the early months, the latter organs become gradually more plump and prominent, and they are occasionally the seat of fugacious pains; but after the fifth they again assume their former flaccidity, and remain in this state till within a few days of the completion of pregnancy, or until two or three days even after delivery, when, in less than twenty-four hours, they are greatly distended. Foderè, Mahon, and others, have observed that the mammæ do not enlarge in those who continue to menstruate during pregnancy. In some rare instances, the breasts inflame and suppurate. The areola around the papilla presents appearances which, especially in a first gestation, afford strong presumption of pregnancy. In subsequent cases, however, this peculiarity cannot be so much relied on, since the colour which this circle acquires, becomes, to a certain extent, permanent.

The local signs of pregnancy, with the exception of the menstrual obstruction, are chiefly cognizable when this function is further advanced. The first local symptom to command attention is suppression of the catamenia. Another occasionally noticed in the early months, though not so important as the last, is pruritus of the external genitals. Nothing very remarkable, however, occurs from the time the patient becomes obstructed, until the close of the fourth, or commencement of the fifth month, when a most unequivocal sign is felt, viz. sensation of the motion of the fœtus, which is a source of much gratification to the parent, and tends, by its influence on her mind, to dispel many imaginary evils. The patient describes this as a very gentle pat, repeated three or four times in quick succession, and felt rather towards either iliac region, than in the centre of the abdomen. Others compare it to what is produced by flatus in the intestines; and we often meet with cases where the one sensation is confounded with the other. The period of its occurrence varies; some females quicken in the thirteenth, some in the fourteenth, but much more frequently this happens some time between the seventeenth and twenty-second week. Until the phenomenon occurs, which is styled *quickening*, it has by some been very absurdly contended that the fœtus does not possess life; but it must be alive from the moment it is conceived. Why its movements, however, should not be felt until this particular

period, has been variously explained. Quickening is now properly viewed not as the motion of the child, but as the ascent of the uterus from the pelvic into the abdominal cavity,* an opinion which, better than any other, explains several attendant circumstances; as the variety in the period of its occurrence in different females, and in the same woman in her several pregnancies, owing to the development of the fœtus being more or less rapid in various instances. This sign is frequently also accompanied by syncope, or a strong tendency to it. That quickening is not the result of fœtal movement, is supported by the fact, that both of these sensations differ completely in their characters, as all mothers affirm. And finally, if this phenomenon arose from the motion of the fœtus, it should be daily afterwards felt by the parent. I knew a lady, the mother of nine children, who, except in her first gestation, never had any feeling of movement after she quickened, and who, were it not for the gradual enlargement of the abdomen, would not have known that she was pregnant; but she was inanimate and passive as a polypus; and what was most singular, her progeny unhappily were as sluggish as herself. Feeble, or almost imperceptible motion, may be ascribed to the vigour of the fœtus differing in degree in various cases, and at different periods; and partly also to excess of liquor amnii. This may be one reason why the movements of the child are not communicated to the parent, even before quickening, since one of the tenth week has been seen, after its expulsion from the womb, to move its limbs; and on the same principle we may explain why, in cases where pregnancy is complicated with ascites, the motion of the fœtus is not felt at all, or until a very advanced period. Such examples also, may palliate the error of those who have confounded pregnancy with ascites. The next local sign is enlargement of the abdomen. This is seldom manifest until the beginning of the fifth month, when, in most instances, the fundus uteri can be felt emerging through the brim; and in the seventh, the patient exhibits a considerable degree of *en-bon-point.*

For the next following means of ascertaining the presence of pregnancy we are indebted to Mayor of Geneva, and Kergaredec of Paris, who were the first to draw the attention of the profession to the application of mediate auscultation as a means of determining the presence of pregnancy, and it will be evident, that if the

* For some information as to the real nature of quickening, consult Lond. Med. Phys. Jour. for July 1810; also the number for June 1812, which contains a very ingenious paper on the same subject, by an anonymous writer.

sounds of the fœtal heart be once distinguished, the nature of the case cannot be mistaken, as there is no sound in the body, so far as we know, which resembles it in its different qualities. Besides the sounds emanating from the fœtus, there is one belonging to the maternal system, which, as it is in general the earliest cognizable, must first claim our attention. It has received the term uterine sound from Professor Nægelè, because, according to his experience, it may frequently be heard over the whole uterus, and generally in the inguinal regions, although it becomes stronger as we approach the stethoscope nearer the seat of the placenta. On these grounds he affirms, that the sound is not caused by the circulation of the blood in the placenta, but by its passage through the enlarged and contorted vessels of the entire uterus, but it is louder over the placental insertion, because here is the centre of the vascular activity of the uterus; to this view it may be objected, that as soon as the connection between the uterus and placenta is interrupted, this sound ceases. Other facts and arguments might be brought forward against Professor Nægelè's idea; but it is not our object to discuss them, for in a practical point of view, the term is of little importance, as all practitioners are agreed, that this sound is only heard in connection with a pregnant uterus.

The placental sound, then, is a *single one*, synchronous with the maternal pulse, and changing, in accordance with it, in rhythm; it is similar to the sound which is heard in a large artery, when there exists some obstruction to the free passage of the blood, from pressure or other cause; and it still more nearly resembles the sound which is heard when the stethoscope is applied over the carotid, or subclavian artery of a chlorotic female. Dubois has remarked its analogy with the murmur which is heard over an aneurismal varix; but from all these a little experience will enable us to distinguish the placental sound, although it has been stated, that it may be so imitated by pressure or disease, that the nicest and most practised ear cannot detect any difference. The placental *bruit* is generally heard loudest in the epigastric region, nearer to one or other side than to the centre; it may occasionally be traced upwards into the hypochondriac, or downwards to the inguinal region. When it is first cognizable, which is generally about the sixteenth week, it is heard immediately above the symphysis pubis, on the linea alba, where the fundus uteri is situated, and thereafter, as pregnancy advances, it may be traced ascending obliquely in the abdomen; some auscultators have thought that they have heard the placental murmur so soon as the tenth week,

but I think they must have been deceived; for at that early period the fundus uteri is still below the brim of the pelvis. At times the placental sound disappears from those points where we may previously have heard it distinctly, and in a short time again returns; in other instances it has never been heard at all throughout the whole period of gestation.

Of sounds emanating from the fœtus there are several; the first which we shall consider are those caused by the action of the heart; these are regular, short, and quick *double beats*, closely resembling those which are heard over the adult heart, but very much fainter and quicker; Professor Nægelè states, that sometimes the first sound only is heard, the second being exceedingly weak, or even inaudible. The number of ventricular contractions has been counted as low as 90 in the minute, and has never exceeded 180; I have observed it to be generally between 120 and 136. They are therefore, by their frequency and double beat, easily distinguished from the placental murmur. In searching for the sounds of the fœtal heart, it ought to be recollected, that they are generally heard in their greatest intensity on that point of the abdomen which lies above the spine of the fœtus. The reason of this is obvious; the heart in the fœtus lies close upon the condensed lungs, and they again lie close on the spinal column, which is generally in immediate proximity to the walls of the uterus, and in this way the sounds are transmitted to the abdominal parietes; as in by far the greater proportion of cases the fœtus presents naturally, with the face to the right, the left hypogastric region will be the point in which the portion of the spine of the fœtus opposite the heart is most frequently placed; and this therefore is the situation in which we ought to commence our investigations for its detection. Thus, besides ascertaining by these sounds the presence of a living fœtus, I have frequently diagnosed its position, and also the existence of twins; if we hear the fœtal heart beating in the left or right hypogastric region, we may be sure that the head presents with the face to the right or left respectively; or if we find that the cardiac sounds are strongest at some point very high in the abdomen, we may presume that the breech will present; and again, if we hear one heart beating in the hypogastric, and another in the opposite epigastric region, or at some other distant point of the abdomen, we may with much certainty predicate the existence of twins, especially if we observe, that one beats a few strokes quicker in a given time than the other; this may be ascertained by two auscultators, one listening at each point at the same moment, and reckoning the

beats during the same and an equal space of time, great accuracy and preciseness being required. By direct investigation it has been found, that the rhythm of the pulsations of the fœtal heart is not in any degree affected by changes in the maternal circulation. The fœtal heart-sounds may generally be distinguished between the eighteenth and twentieth week; in some instances, however, they have not been discovered until a few weeks later. The sounds may be rendered faint, by the placenta being situated directly between the uterine parietes and that portion of the back of the fœtus opposite the heart, or by a fold of intestine having insinuated itself between the same point of the uterus and the abdominal walls.

There is another sound emanating from the fœtal circulation, which is *single*, has somewhat of a blowing character, and is synchronous with the first *bruit* of the fœtal heart; by some it is ascribed to this organ; by others to the transit of the blood through the umbilical cord; the latter I believe to be the more correct opinion, because this sound is always heard when the cord is round the neck of the fœtus, and we find it exactly in those situations where we may presume the neck to lie, in the hypogastric region, when the head presents, and high in the epigastric, when the breech is forward; it may generally be traced running across those regions of the abdomen, in a long narrow line, above or below which, according as the head or breech presents, the fœtal heart is most distinctly heard; at other times it is heard only over a small circumscribed spot in other parts of the abdomen; the funis is then lying close to the uterine parietes, between them and the body of the fœtus. In breech presentations, during labour, this sound may be distinctly traced, descending from its high situation in the abdomen, gradually as labour advances.

Besides the fœtal sounds above described, the motions of the infant, and the strokes given by its limbs, may be detected, communicated through the membranes of the ovum to the uterine parietes; these are gentle, frequently repeated, and continuing for some time without intermission; when the fœtus is considerably advanced, the sound communicated to the ear gives the impression of a blow inflicted by a large rounded body, moving with little velocity. Some auscultators affirm that they have heard the sounds, caused by fœtal motions, at an earlier period of pregnancy than the placental *bruit;* but I have not myself been able to corroborate this statement.

The next sign of pregnancy to which we shall direct atten-

tion, is that termed by the French, "*ballottement;*" this may be investigated in two ways, either externally on the walls of the abdomen, or internally per vaginam; the latter of these I shall reserve for after consideration. *Ballottement* may be felt externally, when the patient is placed either on her back, her side, or knees and elbows; if the woman is on her back, we press the open hand firmly, on one side of the abdomen, and by jerking the points of the fingers of the other hand gently into the opposite side, keeping them always in contact with the integuments, we will feel the fœtus strike with a gentle tap on one hand or other. In whatever position the patient is placed, the mode of examination and the result is the same. It is best felt between the fourth and sixth month, for reasons which will be afterwards given; but as it is a sign by no means accurate, I shall not dwell on it longer.

While making this kind of examination, we are recommended to dip the hand in cold water, and apply it unexpectedly to the abdomen; this, by causing the patient suddenly to retract the abdominal muscles, will allow the hand to come in closer proximity to the uterus, and probably excite the voluntary motions of the fœtus, which will afford us additional corroborative evidence. We may here also notice the state of the umbilicus; during the early months of pregnancy it is somewhat depressed below the level of the surrounding integuments, until about the sixth month, when it is generally on the same plane with them, after which it gradually rises, until at the close of pregnancy it projects considerably above them.

The presence of a peculiar matter in the urine of pregnant women, has been adduced by M. Nauche as a test of pregnancy; this is by no means a recent discovery, although incorrectly believed by M. Nauche to be his own; it is a white flaky pulverulent deposit which appears in the urine, after it has been allowed to stand for some time, or its precipitation may be hastened by adding to the fluid a few drops of alcohol; it is the caseum of the milk secreted during gestation. When the urine is in a fit state to observe this deposit, that is, when it is clear and transparent, it will be almost invariably found; but if the fluid is muddy, our observation will be unsuccessful.

Of the evidences of pregnancy acquired by internal examination, the first that we shall advert to is a peculiar dark colour of the vagina; to which, as a sign, the attention of the profession was first drawn by Jacquemin of Paris and Kluge of Berlin; many practitioners of eminence corroborate this statement from their own experience, but, as it has been ob-

served that the vagina acquires this purplish tint during menstruation, or when any other cause of excitement is acting on those parts, the value of the sign is comparatively trifling. Osiander of Göttingen has proposed to ascertain pregnancy by estimating the pulse of the vaginal artery, such a proposition could only be prompted by a desperate rage for novelty, as to enable us to judge of this test correctly, we would require to be in the daily habit of feeling the vaginal pulse of the unimpregnated female. Of much the same nature as this last is the proposal of M. Nauche, to apply to the uterus, per vaginam, a curved stethoscope, under the name of metroscope, with which he asserts he has heard the motions of the fœtus in the third month.

We shall now attend to what may be elicited by the examination of the uterus, per vaginam, but as these have been treated at full length in a previous chapter, I shall advert to them but very briefly in this place.* It may be useful to remember, that until the third month, none but a person who has enjoyed extensive opportunities, and is possessed of much practical acumen, can determine, from the condition of the womb, whether a female be pregnant or not. At this time, however, this organ will be felt much nearer the external orifice than usual, from its own weight having caused it to descend into the pelvis; from which circumstance also, the vagina feels shorter. The cervix will be felt considerably thicker, and a little shorter, than in the unimpregnated state; and the os tincæ will be so completely closed up, more especially in persons who are pregnant for the first time, that often its situation cannot be determined. The sides of the cervix are first agglutinated by a little mucus, and the aperture itself is at last completely sealed up by the same production. In females who have had a large family, the os uteri is not always obliterated at any period of pregnancy; on the contrary, the point of the index finger may be insinuated a certain way within it. If the womb be balanced on the extremities of the two fingers, while the practitioner is conducting the examination, it will be felt much heavier than usual. When the pelvic cavity is so large as to permit the uterus to remain in it until the early part of the fifth month, tapping gently on the lower part of its body excites the voluntary motions of the fœtus, which will be very perceptible to the finger. But unless this sensation be felt, we cannot say whether the organ contain a mole, hydatids, or a fœtus. Before an effectual examination can be made, it is indispen-

* *Vide* p. 84.

sable that the bladder and rectum should be evacuated. Between the fourth and sixth months, we may acquire strong evidence of the existence of pregnancy, by feeling the *ballottement* per vaginam; to ascertain this, it is by far the most preferable that the patient should be in the erect position, one finger of the right hand is to be introduced, and placed on the anterior part of the cervix uteri, as high as it can reach, the left hand is to be placed on the sacrum of the patient, unless, when she can lean against any object it may be used to fix the uterus, by pressing above the pubes. If we give a slight impulsive motion upward, with the finger of the right hand, keeping it always in contact with the uterus, we will feel a body drop on it with a gentle tap, giving us the idea of an object descending against resistance offered to it by a dense medium, or in other words, sinking through a fluid. Before the fourth month, the fœtus is too small to enable us to feel this distinctly, and after the sixth month it is generally too large to move with the necessary facility; but it compensates for the want of this test, that after this period we can distinguish the presenting part through the uterine parietes.

When the womb can no longer be contained in the pelvis, it gradually ascends upon the brim, and an amelioration of all the complaints incident to the early months, follows. The change is so salutary, that often the patient actually becomes plump, and a marked amendment is observed in her countenance. The ascent of the uterus into the abdominal cavity, its gradual enlargement, and consequent pressure on important organs, occasion numerous diseases in the latter months, most of which, however, are more inconvenient than dangerous. I shall merely enumerate them here, but they will presently be considered in detail: these are, convulsions, cough, cardialgia, heart-burn, constipation, diarrhœa, jaundice, ascites, retroversion of the uterus, strangury, incontinence of urine, stitches in various parts of the abdomen, hæmorrhoids, œdema of the external genitals; and this latter state, with spasms and varices, of the lower extremities.

To conclude this article, I shall proceed to determine what importance may be attached to the various phenomena which have been viewed as pathognomonic of pregnancy; as suppression of the catamenia, morning sickness, enlargement of the breasts, their areola, tumefaction of the abdomen, and motion of the fœtus.

In regard to the suppression of the menses, although this is a state most generally to be depended on, yet it is proper to be aware, that the absence of the secretion does not indi-

cate that a woman is pregnant, or the presence of it that she is not. Suppression is so frequent a consequence of disease, both of the uterine and general system, that it is unnecessary to relate any cases in proof of it. I have myself had under my care, several cases where the menses appeared repeatedly in the early months; and, while writing this article, I occasionally visited the mother of a numerous family, who had then quickened about six weeks previously, and who was nevertheless perfectly regular. She called me one day in a hurry, upon the supposition of uterine action coming on, and having examined per vaginam, I satisfied myself that she was pregnant. As stated when considering the function of menstruation, I think the upper part of the vagina in some instances secretes,—an opinion not more unreasonable, than that a fluid perfectly similar to the menses should, as has often happened, proceed from other parts far more remote from the uterus than this passage. Cases are related by many practitioners of eminence, where the catamenia appeared for one or more periods during gestation, and others where women have menstruated only while pregnant.*

As to the morning sickness, of all the symptoms enumerated, it is the most equivocal; and nothing certain can be deduced from its presence, since it may arise from a variety of irritations unconnected with pregnancy, and since, in many instances, it is wholly absent from the commencement to the termination of this process.

Gradual enlargement, pain, and tension of the mammæ, are symptoms which are no more to be relied on than the morning sickness. These conditions of the breasts are the effects of uterine irritation merely, and may or may not be present during pregnancy. Such results may arise from suppression of the menses only. Even milk in the mammæ cannot be depended on. Many cases are recorded where this fluid was produced by repeated suction, in females who had never been pregnant, in very old women, and even in males. Humboldt has seen it in the latter, during his travels in the interior of Africa. In a communication which I received a few years

* La cessation des regles ne doit pas être un signe certain de grossesse, puisqu' il y a des affections qui suspendent cette evacuation: d'ailleurs plusieurs femmes sont reglées pendant les prémiers mois de la gestation. Mauriceau raconte qu'une femme qui fut pendue à Paris, portoit un fœtus de cinque mois dans son sein, ce donc on s'assura par l'ouverture du cadavre: elle avoit declarée sa grossesse, mais on ne crut pas a la veracité de sa declaration, parce qu'elle étoit réglée. Dict. de Scien. Méd. vol. xix. p. 374.

Dr Francis, in his edition of Denman's Midwifery, relates a case which occurred to Dr Hosack, in which an individual, in her last three pregnancies, menstruated until within a few weeks of her delivery, bearing healthy children at each labour. Beck's Med. Juris., p. 77.

since, from Dr Steinthal of Berlin, he mentions the case of a female of sixty-three, whose daughter gave birth to twins in her first confinement, but being unable to nurse both, the old woman undertook the charge of one of the grand-children, and by frequently applying it to the breast, so copious a secretion of milk at last appeared, that she was enabled to suckle it for seven months. A practitioner of experience will consider the appearance of the *areola* a more unequivocal sign than any of the foregoing. Every man of observation and experience must have observed, that before a woman has ever been impregnated, the areola is not at all well marked, and that its colour is but a shade or two darker than the skin. When the patient has conceived, however, this ring is soon perfectly formed, extends, and becomes very gradually of a deeper brown as pregnancy advances. After delivery, its colour pregressively changes to a lighter shade; and before the woman has been many weeks a nurse, it becomes little deeper than it was before gestation. These changes are developed in every pregnancy; but the colour becomes a little darker with every succeeding conception. Dr Denman states, that enlargement of the mamma from any cause is attended by similar appearances of the areola; but, lest practitioners might be misled by so great an authority, I consider it my duty to protest against such a statement. I never saw the true marks of this circle absent in real pregnancy, nor have I ever seen them present where the individual was not in the gravid state. The colour of the areola, however, is far from being its most important characteristic, as we frequently see very dark coloured rings surrounding the nipples of females who are not pregnant, but who labour under obstructed or painful menstruation; but if the dark areola is accompanied with enlargement of the small glandular follicles around the nipple, and if the papilla, and the integument about its base, appear, as Rœderer has so accurately described them, *inflata*, or as if emphysematous, and if for the space of an inch round the outer edge of the areola, the surface is speckled with spots lighter in colour than the skin, we have a collection of characteristics which have never been seen on any but the breast of a pregnant female. The areola is cognizable at the end of the second month, and as a sign of pregnancy has been undervalued by many practitioners, but this has arisen from their regarding solely the depth of colour of the dark ring, and not taking it in connection with the other marks.

The next sign is the enlargement of the abdomen, than which none can be less depended on, since it may arise from

such a variety of causes; as obesity, enlargement of the liver, spleen, uterus, ovary, mesenteric glands, ascites, and tympanitis; to which may be added, accumulation of the catamenia from imperforate vagina. All these are, by patient investigation, to be distinguished from pregnancy, by the symptoms peculiar to each, which I shall not repeat here, as they will be found under the proper heads. Precipitancy and want of judgment, however, have led to ridiculous scenes, and even unpleasant consequences, by confounding these affections with pregnancy, and *vice versa*. Some time since, I was requested to take under my care the lady of a military officer. She was the mother of several children, and the very picture of health. In the pregnancy previous to that in which my services were required, she had undergone a most rigorous course of discipline under some eminent men both in London and Bath, on the supposition of her being affected with dropsy of the ovarium.

Fœtal movement, when felt by a competent person, is an unequivocal sign. By a competent person I mean the practitioner; the mother is not so, for she is much more easily deceived than members of our own profession, under either of the circumstances already considered. Under certain conditions, even in the latter months, there may be very slight or no movement at all; as when there are twins, or when the fœtus is dead. Sometimes, even when the child is alive, it is difficult to excite it to motion, which, with various diseased conditions of the gravid uterus, is apt to lead the practitioner into error. I was once deceived by an example of this kind, where, on examination per vaginam, a large cauliflower excrescence growing from the os tincæ was discovered; and not being able to feel the motions of the fœtus, I considered the case one of diseased womb, and the patient not pregnant, though it afterwards appeared that she must then have been in the seventh month. To show the mistakes, however, which are committed on this head by the sex themselves, and to afford an idea how necessary it is to exercise circumspection in receiving their reports, there is not, I should think, a man in extensive practice, who has not repeatedly been engaged to attend females supposed to be on the eve of confinement, who were not at all pregnant. In the case of a woman who is most desirous of progeny, but who has little experience in this way, flatus in the intestines, from its occasioning a sensation not unlike the motions of a fœtus, is not unfrequently considered in this light. How often is a practitioner informed by his patient, that she has been sensible of the movements of the child, until within half an hour of its expul-

sion, though, from its being putrid, it must have been dead for several weeks. The supposed movement in such cases, must be referred to partial action of the uterus.

Besides the motions of the fœtus, there is but one other sign which is an unerring test of pregnancy, and that is the sounds of the fœtal heart; it is true that an inexperienced practitioner may mistake both, but they are infallible in so far, that if they are found to be present, pregnancy must co-exist. It will not, however, follow, that if neither of these signs is present, pregnancy does not exist, for the fœtus may be dead, and we will then be deprived of both of these means of ascertaining its presence; important evidence will then be afforded us, by *ballottement* per vaginam, and the placental *bruit;* the former will show us that the uterus contains a body floating freely in a fluid, and the stethoscopic sound will give a presumption of what the body may probably prove; these, together with the suppression of the menses, the areola, enlargement of the abdomen, and the state of the urine if ascertainable, the condition of the os and cervix uteri, and, if it be after the sixth month, our being able to distinguish the presenting part, will indicate with certainty the nature of the case. It is before the fifteenth week that we find the greatest difficulty in forming our diagnosis as to the presence of pregnancy; before this period, *ballottement* is not perceptible, auscultatory sounds are rarely audible, and if the fœtus be dead, the areola may have faded, the mammæ become flaccid, and we can only have the statements of the mother, and other signs to rely on, all of which are frequently subject to fallacy. In such a case we may hazard an opinion, but every practitioner of experience will admit, that under those circumstances we are peculiarly liable to error. It is necessary to be aware that, if the pregnancy be complicated with ascites and the quantity of fluid considerable, the sound may be inaudible, the motion of the fœtus and *ballottement* imperceptible; in such patients, therefore, the practitioner cannot be too cautious in pronouncing his opinion.

We may here mention a peculiar condition of the inner table of the cranium, which is found constant in women who have died during, or shortly after pregnancy; it is an osteophyte, or growth of bone, which is observed on the frontal and parietal bones, according to our own observations most frequently on the latter; it is situated on the eminences of their inner surfaces, and rarely on the depressions; it has been met with on the base of the cranium and on the bones of the face, but never on those of any other part of the body.

It is reddish, apparently highly vascular, soft, easily peeled off with the handle of the knife, and presents exactly the appearance as if a thin slice of young bone had been attached to the old one, by means of some thick, yellowish, viscid matter; it varies much in size, and may be found in specks on the surfaces of the bones, or in large patches, and may be cartilaginous or perfect bone. It was at one time thought to be peculiar to those pregnant females who had died of puerperal fever, but we have ourselves seen it in cases where the women have died from hæmorrhage, and diseases totally unconnected with the genital system, and Professor Rokitanski has observed it in those who have died from Asiatic cholera; the same author states that he has found it in the third month of pregnancy, and as late as three months after delivery, and that it does not appear in cases of extra-uterine pregnancy, or where the uterus contains moles or polypi.*

Finally, although so few of the leading signs of pregnancy, when considered singly, can be relied on, yet it is proper to be aware, that when they are taken collectively, and patiently investigated, a fair knowledge of any individual case may at last be acquired. And when it is remembered that the character, property, and occasionally the lives of our race are in the hands of the practitioner, while his own professional reputation must invariably be more or less concerned, it is hoped that while this will induce him to devote all his powers of mind to the subject, it will, at the same time, prevent him being precipitate in his decision.

Sect. I.—*Management during Gestation.*

Though pregnancy be a natural condition, yet we occasionally find it accompanied by derangement of every important function. This seems to arise from that state of refinement, mental excitement, and indulgence, inseparable from the high degree of civilization which society has now acquired; from irritability of the system at large partly induced by these causes; from the changes consequent on pregnancy itself, and increasing plethora. For, as we descend in the scale of civilization, we not only find that the sex suffer less from pregnancy than those in the higher spheres of life, but that to women in a state of nature, it is productive of little inconvenience. Besides that condition of the system induced by the foregoing causes, there are other changes that imme-

* Med. Jahrb. des k. k. österr Staates, xxiv. Bd. 1838.

diately result from gestation itself, which predispose to many of the diseases incident to that state; as plethora, the generation of fibrine, with which the circulating mass is surcharged during pregnancy, and the influence exerted by the excited state, increasing volume, and weight of the uterus. From this brief view of the origin of the various derangements which are developed in the gravid state, it is obvious, since the causes cannot be removed, that the attention of the practitioner must be chiefly directed towards obviating such as aggravate the condition of the patient, and palliating unpleasant symptoms.

With the exception of venesection, active remedies are inadmissible during pregnancy; and even blood-letting, to the extent of making a deep impression on the system, is followed by excessive irritability, and sometimes by abortion or premature labour. Health, therefore, during gestation, is to be preserved chiefly by regimen.

The primæ viæ should be kept free by mild refrigerant aperients, since accumulations in them, tend to aggravate almost all the diseases of the gravid state, in consequence of the powerful influence which the stomach and bowels exert over all other organs. Although this advice is so obvious, and the fulfilment of it so beneficial, yet there is no rule more frequently overlooked among the sex themselves. If the medical attendant enquire, whether the bowels be in a proper state,—quite regular is the reply; but if he push the inquiry a little further, he will find that they are in the proportion of only one motion every three or four days, or perhaps less numerous. Females are to be met with, who consider it sufficient to have an alvine evacuation once in eight or ten days, and whose sufferings at the commode are comparable only to the pains of labour. No part of the practitioner's duty is of more importance, than what regards the state of the alimentary canal; for when this is deranged, whether in the gravid or unimpregnated state, no function can be healthily performed.

In respect to diet, both the antiphlogistic and stimulating have their inconvenience; and so have also a very liquid, or a very dry one. When the ingesta abound in slops, and in vegetables, they increase vascular plenitude, irritate the stomach, and generate flatus. A stimulating diet, or one of animal food, with cordials, in women of simple habits, would invariably produce excitement, to which, during gestation, there is a very strong tendency. And where the aliment is taken very dry, it is apt to induce constipation. Surfeiting is equally to be avoided, for it often produces violent distur-

bance of the alimentary canal. Neither the quantity nor quality of the nourishment, seems to have much influence on the development of the fœtus *in utero*; for women among the humbler classes produce remarkably stout children, while among those of the higher orders the reverse is generally observed. One thing, however, may be very generally noticed in all ranks of life, viz., that where the sex have carried their indulgence in cordials to frequent inebriety, the fœtus is diminutive and sickly at birth, wherefore simplicity and moderation should always be recommended, and that aliment chosen which is most easy of digestion. Animal food, not too much boiled, will best fulfil this object; and the vegetable may be toast, stale bread, biscuit, or unmashed potatoes. All fat and salted meat are improper; and green fruits, except the grape, are to be interdicted. The preserved sub acid fruits are eligible, since they tend to obviate constipation. The safest beverages are water and table beer; but for those who have been accustomed to indulge, one or two glasses of claret, or the same quantity of white wine, diluted, may be allowed.

Exercise, in proportion to the powers of the patient, is highly proper; and walking is the most safe and advantageous, but it should not be carried the length of causing fatigue. When a female approaches the termination of pregnancy, and is incapable of walking, which, however, rarely happens, a quiet drive on an even road, in an open carriage, may be recommended. Of the utility of exercise in moderation, the superior health enjoyed by females who are obliged to use some degree of corporeal exertion, to gain a livelihood, to those in the higher spheres of life, pampered by indolence and luxury, is too striking to be overlooked.

The dress of females, more especially among the higher orders, is not altogether unworthy the notice of a practitioner. With every other growing evil in civic life, the article of dress has not escaped attention; for it is not, as in former times, shaped for the body; on the contrary, the body is shaped by it. The practice of confining the chest and compressing the abdomen by stays and corsets, is injurious to the mammæ, as well as to the organs of respiration, and may be considered a fertile source of uterine derangement, and diseased structure of the placenta. In whatever manner the sex may feel disposed to torture or distort their own persons in the unimpregnated state, it should be represented to them in firm but respectful language, that during pregnancy, the safety of another and innocent being, depends upon the dress being so made, as to afford warmth and com-

fort to the body, and perfect freedom of action to all its organs, which never could have been contemplated by the prevailing practice of encasing the body in this modern armour, as if they were dissatisfied with the mighty arm which had reared them, or ashamed of the principal object of their formation.

The apartment destined for the repose of the patient, ought to be at as great a distance from the street as the dwelling will afford; spacious, and commanding free ventilation. Its temperature should be preserved within a range of from 50 to 60 degrees of Farh. Therm. Regular hours of rest must be strongly inculcated; and night watching, on whatever pretence, discouraged. As in the latter months, from continually reflecting on their approaching sufferings, the sex are martyrs to despondency, all prudent measures which can tend to prevent or relieve this distressing state, are highly proper. The patient should be induced to enter such society, and indulge in such recreations as are calculated to support her spirits, and dispel *ennui*, without encroaching on those hours which ought to be reserved for corporeal and mental repose. As the great object is to preserve the mind in a state of cheerfulness, so whatever can tend to interrupt this, as domestic grievances, and misfortunes which may befal any of the sex while in child-bed, are to be concealed from those who are on the eve of being so; since there is nothing which has a stronger tendency than this to fill their minds with the most gloomy apprehensions regarding their approaching state.

The functional derangements which require our interference during pregnancy are numerous. To the *nervous system* may be referred vertigo, tinnitus aurium, cephalalgia, convulsions, and spasms of the pelvic extremities; to the *organs of respiration*, dyspnœa, cough, hœmoptysis; to the *vascular system*, syncope, palpitation, varices, hæmorrhoids, œdema of the pelvic extremities, ascites; to the *organs of digestion*, odontalgia, ptyalism, nausea and vomiting, depraved appetite, cardialgia, and pyrosis; to the *intestinal canal*, constipation, diarrhœa; to the *liver*, icterus and hepatitis; to the *urinary organs*, dysuria, incontinence, retention; to the *uterus*, retroversion, extra-uterine gestation, diseases of the placenta, abortion.

Sect. II.—*Diseases of the Nervous System.*

Vertigo, Tinnitus Aurium, Cephalalgia.—Of these affections I shall treat under one head, since they arise from the

same cause, and are chiefly seated in the same organ. By the term *vertigo*, is to be understood giddiness; but under this head, some morbid phenomena, apparently of vision, but in reality of the brain, have been included; such as the appearance of mist, and a sensation of sparkles floating, before the eyes. *Tinnitus aurium*, again, means a noise or sound of various sorts, thought to exist in the ear, since it is so distinctly recognised by this organ. Sometimes it is a sharp, shrill, successive sound; at other times it is acute, continuous, and hissing; and in a third instance, it may be dull, heavy, and intermitting. *Cephalalgia* simply means pain in the head generally, without being limited to any particular region of it. When the uneasiness is confined to one side, it is often styled *hermicrania*, or *megrim*.

Vertigo, though a frequent symptom during pregnancy, is not invariably present. It may appear very soon after conception, but oftener after the close of the fourth month. Full plethoric individuals are the most subject to it. Independently of those conditions of the system, established by gestation, over-indulgence in the luxuries of the table, constipation, stooping, and mental excitement, may give rise to it. This affection consists in preternatural irritability of the retina, or in congestion, and consequent dilatation of the vessels of this tissue. The habit of the patient will enable the practitioner to determine the particular pathological state, which is of the first moment, to enable him to lay down proper rules of practice. Sometimes it is premonitory of syncope, and then it must be ascribed to sudden diminution of the fulness of the cerebral vessels. In the early stages of pregnancy, vertigo is of little import; but when this function is farther advanced, it should be watched, lest it prove the forerunner of convulsions.

Tinnitus Aurium has its origin in the same general pathological state as the affection last spoken of; and the excitement is also similar. Like vertigo, it is a precursor of syncope; and is an attendant on uterine hæmorrhage. In the early months, it is a symptom of no great consequence; but in advanced gestation, it often indicates an increased determination of blood to the head, which may be followed by formidable phenomena, and on this account, it deserves attention.

The *Cephalalgia* of the gravid state is most generally a sympathetic affection. Those chiefly disposed to it, are stout plethoric individuals, and such as are endowed with great susceptibility of the nervous system. The particular predisposition is known by the general habit of the patient.

Headache, arising from nervous irritability, is most frequent in early gestation; that connected with plethora, is seldom encountered until a later period. In the early months, generally speaking, uterine irritation runs higher, than when pregnancy is farther advanced; and hence the more frequent recurrence of nervous headache. In the latter months, again, the womb, by its circumambient pressure, impedes, in some degree, the current of blood towards the abdomen, and other subjoined parts, and hence plenitude of the superior organs of the body. There are several other causes which conduce to this affection, such as the elevating and depressing passions, repletion, but there is none more frequently concerned, than accumulations in the primæ viæ.

The treatment of these different affections will depend on the general habit of the patient. *First*, we must adopt such steps as shall tend to diminish nervous irritability; and, *secondly*, obviate plenitude of the vascular system, while the other causes which have been specified, are either to be avoided or removed. To fulfil the *first* indication, regular exercise in the open air should be inculcated in proportion to the powers of the patient; while she should also be enjoined to reserve a sufficient proportion of her time for repose. The one half of the ingesta at least, should consist of solid animal food, properly cooked, as being more easy of digestion than vegetables, and abstemiousness should be observed. A confined state of the bowels is a great source of irritation; and when they are in this condition, a mild laxative should be exhibited every alternate day, until the excreta assume a healthy appearance. Some discrimination is required in the use of aperients in pregnant females. Where an individual has had one or more abortions, the *frequent* use of even the mildest laxatives is apt to be followed by a similar accident. The neutral salts, Pulv. Jalap C., Pulv. Rhei with Carb. Magnes. combined, and Ol. Ricini, are safe. Nothing is more eligible than mild enemata, especially where there is risk of exciting premature uterine action. If there be no disposition in the womb to throw off its contents prematurely, the strongest cathartics may occasionally be exhibited without any injury. Under these latter circumstances, I have frequently ordered Pil. Colocynth. C. and the Pil. Gambog. C., but the latter, in my own practice, has almost invariably produced deep nausea or vomiting.

When the bowels have been freed, the patient should be allowed a full dose of Camphor, or Sol. Op. Sedat. at bedtime. The former, when it does not offend by its powerful odour, is preferable to the latter. While either of these af-

fections persists, the patient should be advised to relinquish pursuits requiring much study, and sedulously to avoid all causes likely to excite mental irritation.

With the above plan, when those complaints seem purely to originate in mobility of the nervous system, some mild tonic must be allowed. A vinous or watery infusion of Quassia may be ordered; or Sulph. Quin. in form of pills, will be found an eligible medicine. Any of the aromatic tonics, as Canel. Alb., Colombo, or Ginger, given in combination with Cinchona, will be found useful.

Where plethora is the source of the affections in question, purgatives must be more freely employed, but with the precautions already mentioned. The patient must endeavour to acquire the habit, either by the exhibition of an enema early in the morning, or by taking a dose of some mild cathartic before going to rest, of obtaining one free evacuation about her usual time of rising. Abstemiousness, both in drinking and nourishment, must be recommended; of the former, especially, no more should be allowed than what is sufficient to effect the passage of the solid food.

When these measures are not successful in relieving those symptoms which seem evidently connected with plethora, venesection should be performed, to make a *moderate* impression on the system. This is preferable to local detractions, which require more time, fatigue and irritate the mind of the patient, and are not so permanently useful as phlebotomy. Immersing the lower extremities in warm water, by determining the flow of blood towards these organs, often affords temporary relief. The patient while at rest should have her head and shoulders somewhat elevated, and lie on her right, in preference to her left side, or back, that the aortal current may be free; while, by the body being raised, the momentum of the circulation in the carotids and vertebrals may be slightly moderated.

The local remedies which have been recommended for vertigo, tinnitus aurium, and cephalalgia, are very numerous. In vertigo, and more especially when attended by a perception of objects floating before the eyes, sponging the forehead and temples with iced cold water; and the application of Aq. Lavand., Eau de Cologne, Tinct. Camph., Æther Sulph., or a Sinapism to the back of the neck, are in general use. When tinnitus aurium is troublesome, a bit of lint immersed in Tinct. Opii, Tinct. Camph., or in Æther Sulph., placed in the ear, will be found very effectual. A few drops of the essential Oils of Mint, Cloves, or Cinnamon, upon lint, have also proved most efficacious; but whatever be used, the ear

should afterward be stuffed with a little cotton. In cephalalgia, all the local remedies mentioned under the head of vertigo, will often afford relief. Sinapisms to the forehead, temples, or back of the neck, are the most powerful remedies. Leeches are seldom necessary; but when an individual has confidence in their use, they should certainly be applied, since by satisfying the mind, we often relieve the body. When local detractions are actually required, cupping the *nucha* is preferable to leeches, as it acts not only more effectually, but in much less time. The hair should be thinned, or closely cut.

Convulsions.—This affection, so terrific in its appearance, has its origin in the same pathological conditions as the diseases spoken of in the foregoing section. It is said to occur more frequently in persons of a full plethoric habit, and perhaps this may hold true in a great range of such cases; but my own experience is in opposition to it, for of the cases which I have had occasion to witness, the whole were of a spare, irritable, rigid habit of body. It has also been said to happen oftener in first than subsequent gestations; but my practice has equally failed to confirm this position. If the principal *predisposing cause* consists, as I think it does, in great irritability of the nervous system, this is a condition which must increase with the frequency of pregnancy; wherefore, we may also expect convulsions to be more frequent in females who have had many children, than in those whose family has been limited. That this state, however, occasionally appears in a first pregnancy, there is no doubt; and we may presume that its occurrence is favoured by the unyielding condition of the abdominal integuments, whereby the uterus is made to press more firmly on the spine, and the circulation in the descending aorta is somewhat interrupted.

Over-distension of the cerebral vessels has been denied to be a cause of convulsions, merely because, in some instances, no morbid appearances could be discovered on dissection. The same objection might be urged against apoplexy, as occasionally no evidence of effusion, or congestion even, can be detected after death. All we can say of such examples is, that the cause did not amount to a rupture of vessels, but simply to congestion, which is removed during the dying moments of the individual, by the last contractile or projectile efforts of the arteries themselves. Examples of this affection are rarely seen in the early months; every instance I know of occurred in the latter.

The mental passions, as fear and anger, are the most general exciting causes. Of this, cases in illustration are to be

found in the works of every writer on midwifery;* but what is somewhat remarkable, I have known the convulsive fits suppressed by mental emotion. Sometimes we cannot, in the gravid state, refer this affection to any other exciting cause, than great irritation from accumulation of indurated fæces.

Occasionally no cause can be assigned for this malady; the patient is seized as if by surprise from being in a state of perfect health. Dr Denman relates several instances where the attack was sudden, without any apparent cause.† The fairest view we can take of the *proximate cause* is, that it consists not simply in a condition similar to that of apoplexy, viz., plenitude of the cerebral vessels, which is merely a predisposing state, but in excessive morbid irritability of the nervous system, which, when any strong exciting cause is applied, favours its appearance. I am induced to draw this conclusion, since, in some instances where experiments have been performed on the lower animals, almost all the veins coming from the head have been secured, without any thing like convulsions or apoplexy being produced.‡ That the afore-mentioned conditions of the brain exist previously to the application of any of the exciting causes, there can be no doubt, since almost every case of congestion is, for one or two days previous to the fit, preceded by head disorder.

Vertigo, impaired vision, with a feeling of tension and throbbing within the skull, are common precursors. To these flushings of the face, severe cephalalgia, and convulsive twitchings of the upper and lower extremities, succeed. Of all the symptoms known to precede these fits, none is more frequent than a feeling of cramp in the stomach.

As in all these cases, owing to the severe general derangement, uterine action is sooner or later excited, an examination must occasionally be instituted, to determine both the position of the fœtus and the progress of labour, that delivery may be accomplished in any way that circumstances shall point out, whenever the passages are properly prepared; unless there be a certain prospect of this being speedily effected by the efforts of the parent.

Opium, or its Tincture, for the removal of the sensation of cramp in the stomach, which precedes the fit, have been strongly reprobated, but as the late amiable Dr Denman, a writer of unimpeachable candour and integrity, has found

* Dr Denman, in his chapter on this subject, relates the case of a lady who was frightened, in consequence of her carriage having broken down. Labour, preceded by convulsions, came on, and she died undelivered.

† Vide Chapter on Convulsions. Introduction to Midwifery, 5th edit. p. 571.

‡ Consult an interesting communication from the late Dr Kellie, Leith, Med. Chir. Transac. Edin. vol. i.

Opium useful in such circumstances, I see no reason to proscribe this drug, until facts constrain us to coincide in the anathema. Where the symptom in question supervenes, I would suggest the exhibition of plain warm water enemata, as copious and as high in temperature as the patient can support them. By evacuating the colon and rectum, they remove what, in all probability, was the cause of the crampish sensation, and ultimately the spasm itself.

For a more full account of the practice which must be adopted in these cases, see Chapter on Labour complicated with Convulsions.

Spasms of the Pelvic Extremities.—These affections are principally met with some time after the sixth month. They are by no means frequent, which is rather fortunate, for they are not easily combated. They may be observed in females who are pregnant for the first time, as well as in those who have had several children; individuals, however, of a full robust habit, are most subject to them.

Spasms of the lower extremities have their origin in the same general condition of the nervous system to which similar affections have already been referred. In most cases, they commence in the course of the anterior crural nerve, whence they are suddenly transferred into the calf of one or both legs, and thence into the sole of either foot, to the great suffering of the patient. The attack is more common during the night, than in the day time.

The pressure of the uterus upon the brim of the pelvis, torpor of the bowels, over-fatigue, and mental irritation, are the most obvious exciting causes. Spasmodic affections are not confined to the sacral extremities. From the time the uterus has ascended on the brim, these sensations may be alternately situated in the hollow between the false ribs and crest of the ilium, in the *venter ilii*, and along the brim towards either crural notch; when the womb is in the pelvis, even between the third and fourth month, frequently a cutting or tearing sensation is complained of in the tract of the obturator nerve.

These affections are not peculiar to any particular class of women. They arise chiefly from uterine pressure; but of all the exciting causes, there are none whose influence is more general than constipation.

In the treatment, we must, if possible, determine the cause; and as this most frequently is torpor of the bowels, we are, in the first place, to regulate their condition. When there is reason to suspect, either from a previous knowledge of the habits of the patient, or other causes, that the bowels are

neglected, the sick-tender must be directed to preserve the dejections for our inspection from day to day, until we are satisfied that they have resumed their natural appearance.

Besides regulating the primæ viæ, leeches will be found of great service; and to prevent the uncomfortable effects of tepid sponging to promote effusion from their bites, the part should be covered with a warm poultice. General blood-letting has often been employed to relieve these complaints, but except in stout plethoric individuals, scarcely any practice can be more injudicious, as it only increases the irritability which it is intended to relieve.

Independently of the foregoing, there are many other minor remedies that afford temporary relief. When spasms of the lower extremities supervene, while the individual is in the erect posture, they cease by her becoming recumbent: when they seize a person in the night-time, applying cold, as a smoothing-iron to the sole of the foot, allays them; for stitches in the sides of the abdomen,*unaccompanied by vascular excitement*, besides local detractions of blood, opiate embrocations and sinapisms are highly useful. Among the means for palliating these troublesome affections, an elastic bandage so contrived and applied, as to slightly elevate the uterus from the brim, is beneficial. No doubt cases occasionally occur where we are compelled to use blisters, especially for internal inflammations; but as they produce much excitement, and might consequently lead to premature uterine action, they are, if possible, to be dispensed with. In stout plethoric patients, a mild, spare, dry diet, should be recommended; but in those of an emaciated, rigid fibre, the nourishment must be more generous. From most of the foregoing complaints being principally induced by the pressure of the uterus, it is obvious that no permanent benefit can be procured for the patient by any remedy except delivery.

Sect. III.—*Diseases of the Organs of Respiration.*

Dyspnœa.—The function of respiration is very little, if at all, disturbed in the early months. When there is considerable derangement of the digestive organs, however, such a state exerts much influence on some diseases of the lungs. In patients who, while pregnant, labour under phthisis, and at the same time suffer severely from morning sickness, the former malady is not suspended, as is too generally supposed, but on the contrary accelerated. Phthisis may certainly be arrested or protracted, when there is little or no disturbance of the digestive organs during gestation.

In the latter months, however, circumstances are different, as the action of the lungs, whether these organs be sound or not, is more or less impeded. The uterus, by its state of excitement, ascent upon the brim, and gradual enlargement, effects some change in the position of the viscera, which are pushed upwards against the diaphragm, and prevent the descent of this muscle to its natural extent, whereby the capacity of the thorax is diminished in the same ratio. Ultimately the womb itself presses on the diaphragm, and in a considerable degree encroaches on the thoracic cavity, thus presenting a further obstacle to the natural expansion of the lungs. Respiration must also be more or less impeded, by the uterus occupying so large a proportion of the abdominal cavity, and distending its parietes, whereby the elevation of the ribs must be obstructed in the act of inspiration. By whatever cause the natural expansion of the lungs is interrupted, a check is at the same time given to the circulation through these organs; hence congestion of them, and an aggravation of all the diseases with which they may be affected. The foregoing observations will explain why dyspnœa is a constant attendant on pregnancy during the latter months, especially in stout plethoric females, and those pregnant for the first time, nor must we forget the influence of that congestion which is inseparable from gestation. In a first pregnancy, the uterus, owing to the unyielding condition of the abdominal parietes, is forced to ascend towards the chest, and does not project so much from the abdomen as in patients who have been much relaxed by frequent child-bearing. To the foregoing causes, mental emotion and repletion must be added.

From the nature of the cause which most generally gives rise to disturbance in the respiratory function, it is evident that the treatment can only be palliative. When, in full robust individuals, the symptoms are urgent, phlebotomy is to be employed, once or oftener; and under the same circumstances, even in persons of spare habit, as may be necessary. Some allege, that bleeding cannot, either in pneumonia or pleuritis, in the gravid or puerperal states, be so boldly employed as in the unimpregnated, without risking the life of the patient. In so far as puerperal patients are concerned, I have elsewhere proved, that this opinion is without foundation; and in regard to pregnant females, I could relate cases where this absurd notion was acted on, and followed by fatal consequences. I know of no reason, theoretical or practical, why venesection should not be as freely employed in acute diseases of the gravid, as in those of any other state. The

practice may certainly lead to the premature expulsion of the fœtus, but this is trifling compared to the life of the patient. When there is *mere oppression* in females of spare delicate habit, leeches to either side of the chest will afford relief; and their wounds should be covered with a warm poultice. When dyspnœa arises from passions of the mind, which a delicate inquiry, and the general habit of the individual, will determine, a dose of any antispasmodic medicine will allay the disturbance; as Aq. Ammon., Tinct. Valer. Vol., Mist. Camph., or Æther. Sulph.

A free evacuation must be daily procured from the bowels; the diet should be mild and abstemious; and an apartment which is spacious and commands free ventilation, must be put in requisition for the nocturnal residence of the patient, as it is at this time that dyspnœa is most troublesome. While in bed the head and shoulders should be somewhat elevated, and there ought not to be a greater load of bedclothes than is required.

Cough.—This is occasionally a symptom of the early months, but much more frequently of the advanced stages of pregnancy. Females of irritable lungs, and those of full habit, are most subject to it. When it appears early, it may be ascribed either to that general irritation arising from the condition of the uterine system, or to derangement of the digestive organs. In the latter months, it must be attributed to pulmonary congestion, arising from the causes already specified, and the various conditions of the uterus. Cough may also have its origin in irritation of the lungs or mucous membrane of the air-passage, owing to the patient having suddenly passed from a high into a low temperature.

The character of this affection enables us to determine whence its origin. When it results from the mere irritation of pregnancy, or from disturbed digestive function, it is of a dry, barking nature, without expectoration. It is the same when it arises from pulmonary congestion, and is besides accompanied by flushing of the countenance, headache, anxiety, a full, frequent pulse; and is aggravated after a repast or exercise. Cough arising from a catarrhal affection is always attended by more or less expectoration. It has been described by almost every writer as a dangerous symptom, but my experience does not confirm this opinion. The only danger, so far as I have been able to observe, is, that it accelerates the development of phthisis where the predisposion exists. I never knew it induce premature uterine action. Cough is a painful and most unpleasant complaint, both owing to the violent succussion of the body which

results from it; and also to a little of the urine involuntarily passing off during the paroxysm.

The treatment will depend on the cause, which it is highly proper to ascertain, that relief may be afforded as early as possible. When it arises from general plethora, venesection is a proper remedy; and when the cough is severe, even though plenitude be not very obvious, bleeding becomes necessary. With this, the prudent use of saline purgatives, abstemious diet, and paucity of liquids, must be conjoined. Lean boiled animal food is preferable to vegetables, which are productive of flatus. Cough, arising from any of the other causes mentioned, except catarrh, is to be treated by the occasional use of mild laxatives, and antispasmodics, while the diet must be regulated as above stated. Troches containing Opium, Hyoscyamus, Ipecacuan, Tolu, or Camphor, are in general use, and of essential service; their active ingredient may be given in emulsions, but none of them should be continued longer than a few days, as they cease to have any beneficial influence, A large Burgundy Pitch plaster applied on the breast, or between the scapulæ, or on both these points simultaneously, I have found more useful than many remedies in higher reputation. Change of air has often been known to relieve the patient after all other means have failed. Digitalis is frequently administered to allay irritation, but it possesses no advantage over milder remedies; while I have had decided proofs that when given in large doses, it is apt to destroy the fœtus. When there is impaired tone of the digestive organs, Quassia, in some form, or Quinine, must be allowed. In some instances the cough continues very troublesome, until the patient is able to go abroad after delivery.

Hæmoptysis.—Except in cases where there is disorganization of the lungs, this complaint is of rare occurrence. It is generally an affection of the latter months, and those most subject to it are full plethoric females, and individuals of malformed chest and spine. Congestion of the lungs, arising from changes already explained, is the cause to which this affection must be ascribed. We should endeavour to determine whether it proceed from the nostrils or fauces, or from the air-passage or lungs; since, when it comes from either of the two latter, it is of a formidable nature. Hæmatemesis may sometimes be mistaken for hæmoptysis. When blood proceeds from the posterior nares, it will cease when the head is inclined on the chest, or flow from the nostrils; when from the fauces, this can be determined by inspection. Blood flowing from the air-passage, or lungs, is invariably

brought up by hawking or coughing; and is preceded by dyspnœa, pain in the chest, tickling sensation about the fauces, with acceleration of pulse, and flushed cheeks. Hæmatemesis may be known by its own characters, which will be described hereafter. The prognosis must depend on the previous state of the patient's health. When the system antecedently has been sound, health may be restored after delivery; but where there is disorganization of the lungs, as ulcer, or tubercles, premature expulsion of the fœtus may take place, or the patient goes on to the full time, and sinks very shortly after delivery.

The practitioner has always two objects in view in the treatment; *first*, to diminish pulmonary congestion; and, *secondly*, to subdue local irritation: sometimes the hæmorrhage is so profuse as to require the use of remedies to restrain it, which constitutes a *third* indication. The *first* object is to be fulfilled by the prudent use of the lancet, repeated as required, and by the occasional exhibition of mild cathartics. Any of the neutral salts will be found eligible, or the Pulv. Jalap. Comp. may be ordered. The *second* indication is to be fulfilled by the regulation of diet, which should be mild and abstemious. The patient ought to be cautioned against the use of stimuli, whether food or cordials, and also restricted in the use of fluids, in order to obviate every disposition to plethora. With these regimenal measures, we must conjoin the use of Nitras. Potass., in doses of ten or fifteen grains in solution, every second hour. Digitalis, though useful in allaying pulmonary irritation, is inadmissible, for reasons stated in the last subject. When the cough is troublesome at the same time, it must be allayed by the use of Sol. Op. Sedat. or other preparation of this drug, and a blister applied on the chest. Of all the formulæ of Opium, none is so well calculated for the gravid state as the former. A full dose, as from twelve to fifteen drops, should at first be given in any convenient vehicle, and small quantities occasionally afterwards. Unless it be recently prepared, its effects are uncertain. When the effusion from the chest is profuse, a most useful auxiliary to the nitre and the blister, is the Acet. Plumb. in doses of four grains every alternate hour.

Sect. IV.—*Diseases of the Vascular System.*

Syncope.—Except the present, derangements of the circulating system are rare until the fourth month. From what has already been stated on the head of functional disturb-

ances during pregnancy, the causes of those connected with the heart and its vessels may be easily understood. Females endowed with great irritability of the nervous system, and those who are naturally of a robust habit of body, are most liable to the affections which are now to be considered.

Syncope can only be viewed as a mere symptom of some more general derangement. It may be noticed from a few days after conception, to the close of the third month, after which it seldom occurs. Females very susceptible of impression, and those who, previously to their having conceived for the first time, have suffered from a variety of mental emotions, are chiefly liable to it. Some individuals acquire so great a degree of susceptibility, that calling to them in a loud voice, harshly, or by surprise, will induce syncope. In some few instances, I have seen syncope observe a periodic return, from the second until the seventh month. As, in the gravid state, fainting seizes individuals so suddenly, and that, too, while they are in perfect health, it is difficult, more especially in the early months, to account for it, since the uterus at this period, cannot, from its bulk, produce any interruption or irregularity, in the circulation of the heart, or its larger vessels. The womb, however, may influence the heart in another way, viz. through the medium of the nerves, whereby irregularity of its action, as often happens from a similar cause on other occasions, is produced: this inordinate action may lead to some irregular distribution of the blood in the cerebral vessels, and hence syncope. Though this affection be invariably preceded by phenomena which indicate its approach, yet it is, in many instances, too rapid, to give the patient any warning. She feels languid, sunk, sees objects turning round before her, yawns, and stretches herself; sight becomes obscure, she observes things floating before her eyes, her face appears pale, she complains of a noise in her ears, and at last faints. Such paroxysms are seldom prolonged beyond five or six minutes, and they are neither attended by foaming at the mouth, nor convulsive motions of the limbs. Fainting is considered by some, rather a formidable affection; in appearance it certainly is so, but in result it has never proved so in my own practice; though in females disposed to abortion, I have little doubt it may occasionally be followed by that accident.

The treatment consists in the application, during the fit, of means to rouse the vital powers from their prostrate state; and after the patient has recovered, in the exhibition of remedies to diminish the mobility of the system. While syncope is present, the patient must be placed at once in the

recumbent posture, with the head somewhat lower than the trunk, the apartment freely ventilated, and the face sprinkled with cold water. If the fit be protracted, stimuli, as Carb. Ammon., or Aq. Carbon. Ammon., is to be applied to the nostrils, or the latter rubbed on the temples, and cheeks; and Æther Sulph. may either be used in the same way, or given internally. In a case of protracted fainting, the body should be drawn near the fire, and dry frictions over the whole surface conjoined with the foregoing remedies. In the absence of the fit, the patient should be recommended the use of some tonics, moderate exercise in the open air, and to avoid constipation. The body, especially during the milder seasons of the year, or even during rigorous weather, if the patient can bear it, should be sponged with cold water, and immediately afterwards rubbed with a dry towel, until the natural temperature is restored. When an individual feels the fit approaching, an effort to oppose it has often proved successful. Females who are liable to fainting, should avoid going abroad in summer, during the heat of the day; and while walking, they ought equally to refrain from taking a greater degree of exercise than what can be comfortably supported. Over-heated apartments, crowded assemblies, protracted fasting, and all the exciting causes, especially mental emotions, are to be sedulously avoided.

Palpitation.—This affection may appear at any period of pregnancy; but it is most frequent in the latter months. Its attacks are not confined to the daytime, for it occasionally also supervenes at night, whereby the patient is suddenly awakened from sleep, much alarmed. It consists in violent and irregular action of the heart, which may arise either from its functions, or those of its larger canals, being obstructed; and from causes acting through the medium of the nervous system, of which, by far the most frequent, is mental emotion. To these may be added, surfeiting, indigestion, and torpid bowels. Women of acute feelings, and of a plethoric habit of body, are most subject to palpitations. The progressive enlargement of the gravid uterus, its consequent encroachment on the thoracic cavity, and the interruption which so large and ponderous a body must give to the circulation in the aorta, and its immediate divisions, will sufficiently explain the occasional occurrence of this affection. When palpitations arise from the causes now mentioned, they need not excite any alarm, for they soon subside; but when connected with organic affections of the heart or lungs, they are persisting, and the event is too often unfavourable.

The treatment must be divided into that which should be ob-

served while the attack is present, and that which ought to be pursued during its absence. During the paroxysm, more especially in a delicate, nervous female, a large dose of some powerful antispasmodic must be exhibited. Æther Sulph. or Camphor, are the most eligible. Opium, or its tincture may be given with equal advantage, in cases where its previous use has not been followed by excitement of the nervous system. In a full vigorous patient, a moderate detraction of blood should be conjoined. The exciting causes must be carefully avoided; and therefore, abstemiousness in cordials, liquids, and nourishment, should be recommended. A moderate degree of exercise in the open air is useful; the bowels should be well regulated, and surfeiting before retiring to rest, abstained from.

Varices.—This affection consists in dilatation of the veins, most commonly of the lower extremities, along which it is seen in various degrees. Sometimes these vessels are but moderately enlarged, while, in other cases, they are greatly so, and so much distended, as to lead to an apprehension of their bursting, which, however, rarely happens. This condition of the veins is rarely met with to any extent during a first pregnancy; but when it does appear even in a trivial degree, it gradually increases with every succeeding gestation. Females of a lax delicate habit of body, are most disposed to it; but it may be developed under a variety of circumstances; and such occupations as compel individuals to be much in the erect posture, will occasion it. Plethoric females are more liable to varices, than those of an opposite habit. Indolence predisposes to it. Relaxation, and interruption to the return of the blood, by the common iliac veins, from uterine pressure, are the most obvious causes. This affection is not at all dangerous.

Without resorting to measures decidedly more painful and dangerous than the malady itself, nothing radical can be attempted in the gravid state. The practice to which I allude, is one that has been adopted in Paris, and consists in laying open the distended vein, and healing it from the bottom. The *treatment* must be referred to two heads, viz. the local and constitutional. The former consists in affording support to the limbs, by the application of bandages, so applied as to exert a moderate degree of compression. Where veins are much distended, and in danger of bursting, leeches will be found useful. To fulfil the second part of the treatment, the patient must observe the recumbent posture as often during the day, as her other avocations will permit, and use liquids sparingly. Purgatives are highly useful; and the most eligi-

ble are those which will quicken the action of the absorbents. Three grains of Submur. Hyd. should be taken every third night, at bed-time, and followed up next morning, by a small dose of some Neutral Salt. The diet should be simple and abstemious; and the patient ought to indulge in moderate exercise in the open air.

Hæmorrhoids.—This troublesome affection is so well known, that no laboured definition of it need be offered. It consists in small, painful, well-defined tumours, of a pale, or sometimes purple colour, which are situated round the verge of the anus. Sometimes the whole of the perinæum is invested by one large cluster of them; at other times they neither appear on the anus or perinæum, but exist within the rectum. They have been divided into external and internal, according as they are developed without or within the rectum; into open and blind, according as they furnish a discharge or not; and into simple and complicated, according as they may be accompanied by varices, excoriations, or ulcers. This is generally a complaint of the latter months; but when the bowels are neglected, it may also occur in the early stages of pregnancy, more especially in the fourth month.

Those most disposed to it, are females of a lax, delicate fibre, of inactive habits, of a costive disposition, or who neglect the bowels. The nature of piles is not yet settled. Some allege a hæmorrhoid to be a dilated vein; others, a dilated artery; and trusting to the evidence of my own senses, I think not only that each of these opinions is correct, but that the extremities of both the veins and arteries of the part affected may be in a state of dilatation simultaneously; that of the veins, however, consequent upon that of the arteries. The swellings are sometimes purple, at others, pale; and occasionally, when laid open, or when they burst, they yield blood or serum. It is said, that this affection originates in interruption to the free return of the venous blood, caused by the weight of the enlarged uterus,—an opinion of all others the most plausible. When the veins are overcharged, this checks the transference into them of the contents of the arteries; hence congestion of the extreme branches of the latter, from the thinner parts of the blood passing into, and accumulating in the capillary branches. That the extreme branches of arteries, by their dilatation, may constitute hæmorrhoids, was proved by Professor Chausier of Paris, who succeeded in throwing colouring matter into the tumours, by injecting one of the arterial branches of the rectum.* En-

* Dict. des Scien. Méd. vol. xx. p. 462.

largement of other viscera of the abdomen, as the liver, spleen, pancreas, and ovaria, from disease, is often attended by piles; also, from interruption to the free return of the venous blood to the heart.

Besides the pressure from causes mentioned, the exhibition of such aperients as produce irritation of the rectum, may be considered a frequent one of hæmorrhoids. In this light we may view the resinous cathartics; but medicines of this class, whether resinous or not, when given to an overdose, will aggravate piles when present, or produce them in one much predisposed, or who has formerly suffered from them.

In the gravid state hæmorrhoids, may be considered a local affection; and accordingly they are seldom preceded or accompanied by much disturbance of the system. Very often, the first symptom is sudden constipation, followed by a sensation of weight and itching at the anus. When the tumours are internal, the foregoing symptoms are accompanied by frequent but ineffectual attempts to void the fæces, and severe tenesmus, which aggravates the suffering, and is followed by an effusion of blood or mucus from the intestine. In cases still more severe, a protrusion of the gut at last follows. From diminished tone of the parts after a severe labour, we often find the perinæum invested by a large cluster of piles. External hæmorrhoids are easily recognized, and occasion pain both in sitting and walking. There are frequent discharges of flatus from the rectum, impaired digestion, headache, burning heat of the hands and feet, with more or less fever, and general uneasiness. I have never seen any constitutional evils supervene to piles; but in females of an irritable habit of body, and predisposed to abortion, this accident may very possibly be produced.

The treatment must be regulated according as the symptoms are local or general. In slight cases, a recumbent posture, obviating accumulation in the rectum by the mildest laxatives, as Ol. Ricini and the domestic enema, warm fomentations, and a cool spare diet, will be found sufficient. When piles are local even, their cure is often difficult; and in this case, leeches should be applied, and a Burgundy Pitch plaster lightly sprinkled with finely powdered Cantharides, over the sacrum. There is no local measure to be compared to the free scarification of the swellings, and the frequent application thereafter of a warm poultice. In severe examples, with the above treatment we must conjoin general blood-letting; and two dejections are daily to be obtained from the bowels. Sulphur and Supertart. Potass. have long been extolled, but I

am not aware of their superiority over other mild laxatives. Whatever be exhibited, the chief object is merely to exonerate the rectum, without producing severe irritation. When the tumours burst, no apprehension need be entertained for the result, unless the effusion be excessive. The parts are to be bathed with tepid water simply; no astringent, except when there is a very profuse discharge, should be used, until all pain has ceased, or nearly so. If there be hæmorrhage, it must be moderated by a weak solution of Sulph. Alum and compression, together with quiet and rest. When the tumours have become insensible, rubbing the size of a hazel nut of Gall Ointment, night and morning, over them, has long been justly extolled; and with this we should combine, equally often, the immersion of the nates in cold water. When piles become indolent and insensible to local applications, we have been advised to get rid of them either by a ligature or the knife, and the latter, as it is productive of less irritation, should be preferred: we must be prepared, however, against hæmorrhage. This operation should not, if possible, be performed in the gravid state, lest premature uterine action result.

Œdema of the Lower Extremities.—This is an affection of the latter months. Females of a delicate habit of body, and those who are young and plethoric, are most disposed to it. It generally arises from the pressure of the uterus upon the large veins ascending through the pelvis, or upon the vena cava ascendens; at other times, but more rarely, it results from obstructed lymphatic circulation. When connected with plethora, it is accompanied by symptoms of excitement, as pain in the limb affected, acceleration of the pulse, and increased heat. The swelling, generally, is not limited to the extremity, but extends to the labia, and, in some rare instances, over the whole surface, not excepting the countenance. The prognosis in this affection is favourable, especially when it subsides after the patient has been for some little time in the recumbent posture; but when connected with plethora and frequent pulse, it requires to be *most actively* treated. In the *management* of the milder kind, we order gentle aperients, and the recumbent posture. The most eligible laxatives are Neutral Salts, every alternate day. The variety attended with plenitude and excitement requires free venesection, and a full dose of some saline cathartic every second day; an abstemious diet, and the limited use of liquids. Here also, the patient should, as much as possible, observe the recumbent posture, with the head and shoulders somewhat elevated.

Ascites.—This affection is of rare occurrence during preg-

nancy, and seldom seen except in the latter months. A lax delicate habit of body, whether original or acquired, predisposes to it. The system may be enfeebled by laborious occupation, impure or defective nourishment, frequent child-bearing, or protracted disease. The occasional causes are numerous, and the most frequent are, morbid, thoracic, or abdominal affections; and sometimes pregnancy. Organic disease, either in the thorax or abdomen, by retarding the circulation, occasions distension of the abdominal vessels; which latter relieve themselves by exhalation. The same explanation of dropsy arising from the pressure of the enlarged uterus, or ovary, may be offered.

The first symptoms are infiltration of the ankles and feet, most obvious in the evening, gradually extending along the extremities; scanty urine, dry skin, thirst, dyspepsia, and the abdomen enlarging with unusual rapidity. To these succeed troublesome cough, difficult respiration, and restless nights from frequent startings during sleep, unpleasant dreams, and inability to remain long in the recumbent posture. It is sometimes difficult to determine whether the dropsy be peritonæal or ovarian. It should be remembered, however, that in ascites one of the earliest symptoms is œdema of the ankles, succeeded by diminution of urine, impaired digestion, with general bad health; whereas, when the accumulation is ovarian, the swelling is slower in its progress, more local, less uniform, unequal to the fingers; and, excepting the functions of the diseased organ, every other will be natural. The *prognosis* should be guarded, more especially when the disease appears in more than one pregnancy; for after delivery, in such cases, it makes rapid strides, and proves fatal. Sometimes premature labour is induced by the combined irritation of the dropsy and pregnancy, and the patient gradually sinks after delivery. Such cases are exceedingly intractable.

The treatment depends on the stage of the disease. In the early, as well as in the latter stages, so long as there is no serious derangement of any important function, we must be satisfied with palliating. From the more powerful diuretics I have never derived any advantage; on the contrary, I have had strong grounds for suspecting that premature labour was induced by some of them, especially the Tinc. Digital. Purp. The mildest of these ought to be preferred, as the Nitrate, Acetate, or Supertartrate of Potass, in solution; but the first of them must be given in small doses, well diluted, lest it produce strangury. With these, the use of mild laxatives, and venesection, must be combined. When

the accumulation and irritation are so great as to threaten life, the fluid must be abstracted by the trocar, a practice which may be adopted with safety. Care, however, must be taken not to involve the uterus; but as the accumulation will be considerable before such an expedient can be required, there will be little risk of wounding this organ. Low down in either iliac region, should be preferred to the linea alba.

Sect. V.—*Diseases of the Digestive Organs.*

Odontalgia.—Generally speaking, this is a complaint of the early months, but patients have occasional attacks of it throughout the whole period of pregnancy. Sometimes it never occurs until within two or three days of the commencement of labour. This is often a purely sympathetic affection, excited through the influence of the uterine on the nervous system. There is not a more fertile source of toothache than torpid bowels; and hence the more rapid decay of the teeth in females than males, who are more attentive to the condition of the primæ viæ, and less disposed to constipation than the other sex. The origin of this complaint may also be frequently traced to indigestible food and surfeiting. It is unnecessary either to describe this affection, or to enter very largely into its treatment, for who has not felt in their own persons the sufferings of which it is productive; and who has not heard of the thousand remedies which have been recommended for its removal? All the essential oils, as those of Cinnamon, Cloves, Peppermint, and Turpentine, have occasionally afforded temporary relief, so have Alcohol, Camphor, and Opium; nor must we forget the use of the stronger mineral acids, especially the nitric, and a red-hot wire introduced into the hollow of the tooth, with a host of other remedies. Externally, sinapisms and blisters applied over the jaw affected, have frequently afforded relief. When the tooth is carious, however, no permanent advantage can be derived from any remedy except the nitric acid and extraction. In a habit predisposed to abortion, it is said that the removal of a tooth is apt to occasion this accident; but I have never seen premature uterine action induced by it; while, as is well known, abortion has been excited by violent and long-continued odontalgia. On the whole, therefore, the tooth should be extracted when really necessary.

Ptyalism.—A preternatural flow of saliva is an affection of the very early months, and generally ceases by the end of the third. It may be referred to the influence of uterine irritation on the stomach, betwixt which and every other

organ there is so powerful a sympathy. Ptyalism is not at all common, and is more troublesome than dangerous. The salivary glands and the mucous lining of the mouth furnish the discharge. It is scarcely necessary in any instance to interfere; but when a practitioner is importuned, from four to six leeches should be applied at different points from ear to ear; a dose of some mild laxative medicine, such as the Pulv. Rhei., administered every alternate day; while stimuli, whether condiments, food, or cordials, are to be carefully avoided. As a refrigerant and astringent, ten grains of the Nitrat. Potass. in two ounces of water, may be ordered once in four hours.

Nausea and Vomiting.—These are familiar to every one, under the appellation, morning sickness; and of all the indispositions induced by pregnancy, they are the most general. They are among the earliest complaints of gestation, but generally do not appear until after the patient has passed a period; sometimes not until pregnancy is far advanced. In other instances these complaints are present during the two latter months only. Occasionally, where severe dysmenorrhœa has preceded impregnation, there is little or no morning sickness at any period; and in such cases, the appetite is improved by gestation. Though this gastric derangement be severe in one pregnancy, it may be absent entirely in the next.

These affections chiefly arise from the influence of the uterus in a state of high irritation on the stomach; and another very fertile source of nausea and vomiting in the gravid state, is torpor of the bowels; to which we may certainly add, over-indulgence in liquids and vegetables. Sickness in the latter months has been ascribed to the enlarged uterus pressing the stomach against the diaphragm, but the rare occurrence of this affection in the latter months, is a clear proof of the little influence of this cause. When the morning sickness appears at this period, it may with greater justice be ascribed to accumulation in the bowels. When these affections are about to appear, the patient, for some days at first, complains of mere languor and lassitude on rising in the morning; but as noon approaches, they gradually wear off. In a few days, there is complete loss of appetite; and to this, first nausea, and shortly thereafter actual vomiting, supervene in succession. This complaint, in a given number of patients, may be observed in various degrees of intensity; sometimes it is very trivial, at others most distressing. In the latter state, the patient can scarcely retain a particle of nourishment, and emaciation, and sometimes apprehension of death from inanition, is the consequence. In such cases,

the vomiting commences the moment the woman lifts her head off the pillow in the morning, and is succeeded by deep nausea, which continues until the day is far advanced, when a state of excessive languor supervenes. At length, quickening in most cases terminates this distressing complaint.

The rejected matter varies in its composition. Independent of the ingesta, sometimes bloody mucus is brought up, at other times pure bile. Though formidable in appearance, the complaint rarely proves so in reality. I imagine most gentlemen of extensive practice have witnessed a few instances in which severe vomiting induced abortion; but judging from the result of my own experience, I should deem such examples of rare occurrence.

In the treatment, every thing depends on the complaint being early attacked, in which case the sufferer is almost certain of being materially benefited. The indications are twofold; *first*, To diminish or remove general irritation; and, *secondly*, To palliate unpleasant symptoms. As the irritability which prevails during the early months must be ascribed to suppression of an accustomed evacuation, so the most effectual mode of relieving it is venesection. If the patient can support blood-letting, or have no objection to it, from four to six ounces should be taken from the arm monthly, at or near the period when the menses should have appeared. Where the individual is too delicate to bear phlebotomy, or has a dislike to it, let an adequate number of leeches be applied, either to the epigastric region or to the groins. Another great source of irritation, especially in advanced pregnancy, not to be overlooked, is intestinal accumulation. Every alternate night at bed-time, two cathartic pills should be ordered, and the following morning early, a tea-spoonful of some Neutral Salt, that the patient may obtain one or two copious evacuations before she quits her chamber. A very copious enema of warm water, containing a small proportion of Mur. Sod., given early every morning, will be found particularly useful.

Among the palliative means, none are more eligible than effervescing draughts of the Carbonate of Soda and Tartaric Acid in solution. Seven scruples of the former in half an English pint of water, and two drachms of the latter in an equal quantity of water, will effervesce briskly when mixed: an ounce of each solution may be given according to the inclinations of the patient, on whom, when frequently administered, it will act as a mild laxative. A small compress of linen immersed in acetous acid, or in any kind of ardent spirit, and applied to the region of the stomach, has often allay-

ed or mitigated the vomiting; and a sinapism or blister has also been of marked benefit; but unless the bowels be kept free, remedies will be of little avail. The regulation of the diet is an essential part of the treatment; it should be light and abstemious; and animal food in small quantity is preferable to vegetables. No more fluid should be allowed than what is absolutely necessary. Finally, where the irritation of the stomach runs high, the patient should endeavour, by changing her hours of repast for some days in succession, to ascertain at what period this organ can best retain food. Some, for example, can take nourishment at breakfast-time only, some at dinner, and others only at supper. With the exception of one or other of these periods, they are incapable of retaining aliment. When the stomach will not at any time retain food, an enema of strong beef soup, or calf's-foot jelly,—eight ounces of the former, or five of the latter, with a few drops of the Tinct. Opii, should be thrown into the rectum, once every four or six hours.

Depraved Appetite.—During gestation, the appetite, in many females, is extremely capricious. Individuals have been known to entertain an unconquerable aversion to articles of nourishment, of which, previous to impregnation, they were exceedingly fond; while, on the other hand, they have sometimes eagerly desired things of which even the mere mention, in the unimpregnated state, was sufficient almost to nauseate them. For example, some persons, while pregnant, consider raw oysters a great relish, though previously to gestation they could not bear them: others, during gravidity, cannot taste cheese, though fond of it previously; some pregnant females express a vehement desire for fruit while out of season, which was never longed for when it might have been procured. These fancies especially characterize the early months, and appear sometimes even a few days after conception, but they gradually subside as gestation advances, and rarely continue after the close of the fourth month. The term *longings* is in familiar use to designate the above inordinate desires, which were not supposed to originate entirely with the mother, but to be partly also excited by the fœtus; and accordingly it is still sometimes considered imperative to gratify them, lest the colour or figure of the thing wished for should appear on the infant at birth. The works of the older writers abound in the most incredible stories on this head; but accurate investigation and higher enlightenment have triumphed over these superstitions. It would require a strong dose of credulity to believe the story of Tulpius, who knew a woman that devoured during

her pregnancy, 1400 salted herring; and whose infant was equally fond of them, without having herring marks upon its body.

In regard to the mode of relief, when the thing wished for is harmless, it should be allowed, since indulgence is occasionally followed by the removal of the longing. Some pretend, that when cinders, plaster, putty, &c. are longed for, absorbents are indicated.* Emetics have been recommended for the cravings in question; but though severe sympathetic vomiting, during gestation, is often harmless, yet, excited artificially, it may be dangerous, and has produced premature uterine action. A more effectual and safer practice is, the use of mild refrigerant laxatives, such as Pulv. Jalap. C., Supertart. Potass. or other aperient salts. When we consider that nausea and vomiting, under other circumstances, arise from surfeiting, indigestion, and costiveness, the proper regulation of the diet and bowels is indispensable. When accompanied by uneasiness in the region of the stomach, local bleeding will be useful. After the primæ viæ have been regulated, some bitter, as Infus. Quass. for some days, should be recommended. The diet ought to be mild and abstemious. Toast or biscuit is preferable to plain bread.

Cardialgia and Pyrosis.—I shall consider these in one article, for they are mere varieties of the same derangement. Though most frequent in the early months, they may appear at any period of pregnancy. A morbid state of the gastric juice obviously exists from the superabundance of acid. Their principal exciting causes are surfeiting, irregularity in the period of eating, indigestible food, such as fatty or oily matters, salted meat, fruits, especially nuts, or uncooked vegetables, costiveness, and mental emotions either of the depressing or elevating kind. The influence of irregularity of diet in producing these affections, is great; and more particularly, eating oftener than had been customary. Many persons not used to lunch, are sure of an attack of heartburn, in a few hours after this indulgence. The stomach seems to be overpowered, debilitated, and its secretory functions disordered. These affections may, however, occur in the morning, when the organ is empty. *Cardialgia*, or heartburn, is characterized by a gnawing or burning pain at the cardia; *pyrosis*, by a similar sensation at the pylorus, less severe, but more general than that in cardialgia; accompa-

* Quelquefois la nature elle-même indique le traitement par la qualité des substances sur lesquelles porte l'appetit: le desir de manger de la craie, du plâtre, suppose des acides que l'on cherche à dissiper par l'usage des absorbans.—*Gardien*, tom. ii. p. 41.

nied with a sense of constriction, as if the stomach were drawn towards the spine; occasionally nausea, and ejections, either of a sour or insipid watery fluid. These complaints are very troublesome, but fortunately, are not equally dangerous. As happens in diseases already considered, cardialgia and pyrosis cannot be permanently relieved during gestation. *In the treatment*, we have two objects in view; *first*, To palliate unpleasant symptoms; and, *secondly*, To prevent their recurrence. Where acidity abounds, the Carbonate of Lime and of Magnesia may be given; and when, by repetition, they have become ineffectual, the Ærated Water of Potassa and of Soda, may be advantageously substituted. These latter are very grateful to the patient, and are among the most effectual palliatives. To relieve pain in the stomach, a small dose Sol. Sedat. Op., in almond emulsion, is useful. Temporary relief may sometimes be obtained during the paroxysm, from tepid demulcent drink of any kind, as barley water, milk and water, or milk whey. The almond emulsion is much superior to Mucilage of Gum Arabic, which is also extolled. I have often, during the fit, given fifteen grains of the Nitrate of Potass. in two ounces of water, with immediate relief. In obstinate cases, moderate detractions of blood must occasionally be conjoined with the foregoing remedies. The second indication is to be fulfilled by strict attention to the state of the bowels, and to the regulation of diet. Without this, no relief can be procured. Indigestible substances, vegetables, and liquids in undue proportion, should be interdicted. Animal food, easy of digestion, and moderate in quantity, is best; and dry toast or biscuit should be preferred to any other vegetable production.

Sect. VI.—*Derangements of the Alimentary Canal.*

Constipation.—There is a disposition to this state throughout the period of pregnancy, but especially in the latter months, when it often prevails with much obstinacy. There are three very obvious causes for costiveness; *first*, The sedentary occupation of the sex; *secondly*, The pressure of the gravid uterus upon the rectum and colon; and, *thirdly*, An inactive state of the alimentary canal, induced by the preponderating current of nervous energy, towards the uterine system.

It has already been observed, that all the sympathetic affections of pregnancy, are aggravated by constipation; it induces general uneasiness, nervous and arterial excitement, loss of appetite, restless nights, and erratic pains in the abdo-

men. Ultimately, the mucous lining of the intestines is irritated, the excretory ducts discharge copiously, and severe peristaltic motion, with tenesmus, harass the patient. Obstinate constipation, during gestation, must be watched, as it may have unpleasant consequences. Abortion, or premature labour, in a person predisposed, may certainly be produced by the straining efforts, for the exoneration of the rectum. Distension of the latter, retards the process of parturition; and peritonitis has supervened, where no other cause could be traced. Severe colic has occasionally resulted from constipation. The habit of going daily, though for a time ineffectually, to the commode, must be acquired. Indulgence in the moderate use of the subacid fruits, as prunes, stewed apples, tamarinds, &c., should be allowed, as they tend to keep the bowels free. With these means, a liquid diet ought to be conjoined, as gruel and soups.

Besides these mild measures, the patient must take some aperient as occasion requires. The Pil. Aloet. Magnesia and Rhubarb combined, Castor Oil, or the domestic enema, may be employed. When there is obstinate constipation, the solid matter must first be softened down, by reiterated enemata of warm water; and Ol. Ricini administered by the mouth. When, from induration of the fæces, the transit of an injection pipe is prevented, they must be scooped from the rectum. Where there is general uneasiness of the abdomen, with pain on pressure, venesection is necessary, and warm enemata frequently exhibited.

Diarrhœa.—This affection is too familiar to require definition. It may appear at any period of pregnancy; but as it is frequently a consequence of constipation, it is generally met with in the latter months. Occasionally diarrhœa and constipation alternate with each other. It consists in irritation of the mucous lining of the intestines, and consequent exhalation from their excretory ducts, a state, of which a variety of causes may be mentioned. Of these, none can be more familiar to us than constipation. Surfeiting, exposure to cold, mental emotions of the depressing kind, may all produce it; and to these, impaired tone of the digestive organs may be added. When the complaint arises from repletion, and from impaired tone, the aliment indigested, may pass into the intestines; and by exciting irritation, cause increased flow from the excretory ducts. When cold is the exciting cause, the exhalation on the internal surface of the bowels, is simply augmented, from the check which is given to that on the skin. The depressing passions act by producing relaxation. Sometimes the excreta are merely changed in

point of consistence, and in frequency of evacuation; at other times, they exhibit distinct evidence of morbid action. In the former state, when the tongue is clean, or but slightly coated, there is seldom any disturbance of the circulating or digestive systems; nor do the dejections yield an offensive odour; occasionally, they are of a lighter colour and more efficacious than usual. When diarrhœa is attended with much derangement, the skin is parched, vascular action increased, tongue much loaded, considerable thirst, appetite impaired, breath fœtid, bitter taste in the mouth, the alvine dejections are dark and offensive, tenderness of the abdomen, some degree of straining at the *commode*, and occasionally, headach and vomiting. The result in a habit predisposed may, under these circumstances, be abortion or premature labour.

In the more simple variety of this affection, the first object is to remove offending matter in the intestines, by some mild laxative as Rhubarb; and the second, is gradually to moderate the diarrhœa, by the regulation of diet, and the cautious use of astringents. Confect. Aromat., Tinct. Op., Tinct. Kino, vel Catechu, may be allowed in small doses, after every liquid evacuation. The diet should be dry, abstemious, and consist principally of animal food, without fat. When the disease is attended with constitutional derangement, as in the second variety, the bowels must be gently moved daily by some mild laxative, until the stools have assumed a healthy aspect, while we are also to restore the functions of the skin. Pulv. Rhei. et Ipecac. combined, and exhibited in reiterated small doses, will be found very effectual. When the tongue and external surface are parched, a moderate dose Pulv. Ipecac. C. should be given at bed-time. If there be increased vascular action, with tenderness of the abdomen, and severe straining, it will be highly proper to premise venesection, and the repeated exhibition of large enemata of warm water. Whenever the alvine discharge has assumed a natural appearance, it must be gradually moderated by the practice recommended in simple cases, and the patient should be allowed bitters in some form, such as Quassia, Canel. Alb., or Colombo. Warm clothing should be recommended.

Sect. VII.—*Derangements of the Hepatic Function.*

Icterus.—Hepatic derangements are occasionally met with during gestation. I had a patient in whose liver an extensive abscess formed, and it burst in the early part of the eighth month during a fit of coughing. She felt something

give way within her, and this was soon followed by vomiting of pus, of which a considerable quantity was also discharged by stool. The individual had a perfect recovery, and was safely delivered at the full time. Icterus is the most frequent biliary derangement during gestation, and may be observed either in the early or latter months. The yellow colour of the external surface, which is the most prominent feature of this affection, arises from the discoloration of the blood by bile, frequently depending on obstruction of the hepatic ducts. In early pregnancy, it is difficult to say by what cause, or obstruction, icterus may be induced; but in the advanced stages, it may be safely referred to the pressure of the enlarged uterus; or to some morbid condition of the liver itself. The patient is sometimes seized with this affection without any previous warning; but, generally, it is preceded by a fit of vomiting, tension, and a sensation of weight in the right hypochondrium, alternate shiverings and flushes, cough and loss of appetite. Besides the liver, several other organs are occasionally involved. Sometimes there is severe headache, coated tongue, parched skin, spare, high-coloured urine, and torpid bowels. The tunica albuginea, and the nails, are the first parts in which biliary effusion appears. I have never seen any serious effect from icterus in the early stages; but in two patients who had it in the latter months, premature labour supervened.

In the treatment, when this affection is unattended by diseased structure of the liver, little requires to be done, for it disappears by merely regulating the bowels. The active remedies employed in jaundice under other circumstances, as emetics and free purgation, are inadmissible here, lest premature uterine action might be induced. The milder aperients are to be used every alternate day. In the case of a stout plethoric patient complaining of pain in the region of the liver, with other symptoms of excitement, venesection should be ordered. When the disease comes on suddenly after some mental emotion, spasm of the biliary ducts may be suspected, in which case, after the bowels have been cleared out, a large dose of Opium, or of its tincture should be exhibited. A woman in advanced pregnancy suffering from this affection, should be directed, while in the recumbent posture, always to lie on the left side.

Sect. VIII.—*Diseases of the Urinary Organs.*

Dysuria.—From the intimate connection of the bladder with the uterus, derangements of the former organ may na-

turally be looked for during pregnancy. Strangury consists in a discharge of the urine by drops, attended with pain, and difficult micturition. This condition generally occurs in early gestation, and may arise from a variety of causes, as the pressure of the uterus upon the neck of the bladder, spasm of the sphincter vesicæ from the irritation of piles, diarrhœa, and torpor of the bowels. Sometimes it results from calculus, or excrescences in the urethra, and occasionally from the absorption of Cantharides.

When it arises from pressure on the bladder, no permanent relief can be obtained until the uterus ascend above the brim; but in the meantime, the rectum must be kept clear. Should the painful sensation still continue after the womb has left the pelvis, leeches and warm fomentations to the vulva, will allay the irritation; and with these, barley-water, gruel, and lintseed tea, for drink, are to be combined. When dysuria arises from spasm, produced by some adjoining irritation, warm fomentations to the vulva, and to the anus when the seat of piles, with the internal use of Camphor, will be found successful. In all cases where the complaint is connected with intestinal irritation, much benefit will be derived from large enemata of warm water; and when aperients are required, Castor Oil should be preferred to Neutral Salts, as the latter tend to produce additional irritation of the deranged organs. When it becomes necessary to administer any remedy to relieve pain, Tinct. or Ext. Hyoscyam. or Sol. Op. Sedat., should be ordered.

Incontinence of Urine.—This is generally complained of from the seventh month onwards; but occasionally it is present early in gestation. It is produced by the pressure of the uterus preventing the expansion of the bladder, by coughing, laughing, or other action in which the respiratory muscles are excited. When the pressure in question has been of long continuance, it may be presumed to depend on paralysis of the sphincter vesicæ. This affection is loathsome, and every thing must be done to ameliorate the condition of the patient. Early in gestation, indeed at any period of a *first* pregnancy, venesection, by producing general relaxation, and thereby partially relieving the bladder, must prove beneficial. Doses Tinct. or Ext. Hyos., or the Sol. Op. Sedat., must at the same time be given, and the use of liquids limited. Incontinence with pendulous abdomen, requires a suitable bandage to elevate the uterus, and relieve the bladder from injurious pressure.

Retention of Urine.—This complaint is occasionally met with, both during the early and latter months, but more fre-

quently in the former. The bladder, like the intestines, may become inactive from defective innervation; or it may depend on the pressure of the uterus on the neck of the bladder, or on calculus in this organ. Retention in the early months must be watched, as it may cause retroversion of the uterus, or inflammation of the neck of the bladder. Medicines have very little influence when the complaint is mechanically induced; more is to be accomplished by the habit of statedly discharging the urine, without reference to inclination. When, however, it has accumulated notwithstanding the procedure just recommended, the catheter must be used.

Sect. IX.—*Derangements of the Uterus.*

Retroversio Uteri.—This variety of malposition of the womb is alluded to in a treatise ascribed to Hippocrates, and in Ætius we have a confused article on different positions of this organ. M. Gregoire of Paris, gave the first accurate description of this accident. His pupil, Mr Wall, who afterwards settled in London, was soon called to a labour which brought to his remembrance the observations of his preceptor. By Dr Hunter, whose assistance was ultimately required in this case, the subject was still farther elucidated: he styled it Retroversion, and the accident has since been occasionally met with, and described by others. It denotes that the fundus uteri has fallen backwards and downwards between the bladder and the rectum, while the os tincæ is directed towards the pubes, and so raised as scarcely to be felt by the ordinary examination. The accident is ascertained by sudden obstruction of the bowels, sudden, and almost complete retention of urine, severe pain in the sacrum, with bearing down efforts. The case may be further recognised by examination *per rectum et vaginam.* When the latter passage is explored, we find it partially or completely occupied by a tumour, which, when freely pressed by the finger, feels solid and irregular; the advance of the latter is impeded, the os uteri consequently cannot be reached, and the patient being enabled to evacuate the bladder when the swelling is pressed towards the sacrum, removes all doubt as to the nature of the case.

The predisposing causes of retroversion are, a capacious pelvis, relaxation of the uterine ligaments, and preternatural position of the fœtus. When the latter is in malposition, it deranges the equilibrium of the uterus, and tends to revolve its fundus towards the sacrum. Fear, by producing relaxa-

tion of the uterine ligaments, may also be added as a cause. One important exciting cause has been satisfactorily stated by Dr Denman, viz. over-distension of the urinary bladder, which, rising beyond the brim of the pelvis, drags the cervix uteri after it. This explanation has appeared just, in a large majority of the cases that have been published; but although retroversion must frequently be owing to over-distended bladder, it may doubtless arise from various other causes, particularly mental emotion and over-exertion;* and when it happens from either of these, I agree with Dr Hunter in considering retention of urine as the effect, and not the cause of misplacement. Violent action of the diaphragm, and other abdominal muscles, whilst the patient is at the *commode*, or lifting a heavy body, by forcing the viscera towards the brim of the pelvis, is apt to produce retroversion. It used to be disputed whether this displacement occurred suddenly or slowly; but, in these days, I suppose it will be admitted that it may happen in either way. When, in a healthy female's first pregnancy, the accident occurs, whether from over-distended bladder or otherwise, its progress must be slow; for the unyielding condition of the supporting *media* of the uterus will prevent so great a change from suddenly taking place. Retroversion is often attended with stillicidium, which also will retard its progress.

In females of a relaxed habit of body, and in those who have had a large family, malposition may be suddenly produced by any powerful exertions which excite violent action of the abdominal muscles, as those formerly mentioned.

Retroversion can only happen during the period the uterus is in the pelvis, which varies in different women, and in the same woman in different pregnancies, according to the pelvic capacity, and the volume of the uterus. It has generally been met with between the third and fourth month; but from the varying dimensions of the pelvis, and other circumstances, no one can deny the possibility of its occurrence at a later period, without disputing recognised principles of midwifery. In Smellie's collection of cases,† and in Dr Merriman's Essay on this subject, examples are related where the uterus became retroverted towards the close of the fifth month. I measured a pelvis, which, divested of its linings, was six inches and three quarters in lateral diameter; and I saw the uterus wholly prolapsed in a woman who was within three days of her sixth month of pregnancy. In such

* Vide Med. Observ. and Inquir., vol. v.; also Med. Comment., vol. vi.

† Vol. i. p. 149.

cases, it would require reasoning of more than ordinary cogency to convince the unprejudiced that retroversion could not occur later than the fourth month.

The *termination* of this accident is various, but fortunately that in reposition, and retention of the ovum, until the completion of gestation, is the most frequent.* Occasionally the womb continues retroverted until the latter months,† or until pregnancy is completed.‡ This fact has not been called in question, except by a solitary individual, who pertinaciously denied the possibility of the uterus continuing retroverted during the latter months. Where the organ remains misplaced until pregnancy is far advanced, or completed, and where labour comes on, a dead fœtus may be expelled, *per vias naturales*, with safety to the parent;‖ or the womb, by excessive action, may be ruptured, and its contents escape into the abdomen, whence, if the patient survive, they are discharged at various points, and considered, perhaps, as the sequelæ of an extra-uterine fœtus. Other cases terminate by inflammation and gangrene of the urinary bladder.§ Sometimes the patient sinks soon after delivery, from long continued irritation and hectic.¶ When a practitioner is called early, and the bladder can be evacuated, a favourable termination may be expected. Even when gestation is in the latter months, before the displacement has been discovered, if the urine can be voided with facility, or if the catheter can be easily passed, our opinion should be favourable, but the fœtus may be lost, as happened in Dr Wise's case, 2d vol. Edin. Jour. Med. Scien. When the instrument cannot be introduced, the situation of the patient is precarious.

In the treatment, it has been proposed to relieve these cases in a variety of ways; *first*, by manual assistance; *secondly*, by puncturing the bladder; *thirdly*, by the section of the pubes; and, *fourthly*, by piercing the uterus. The evacuation of the urine, by whatever steps it may be accomplished, whether by the trocar or the catheter, seems, from what happened in some of the cases to which reference has been made, *to be all that is required to enable the uterus, in far the majority of instances, to resume its natural position.* In the

* Lond. Med. Observ. Inquir., vols. iv. and v. Dict. des Scien. Méd. Med. Comment. Ed. Med. Jour. Lond., vol. ii.

† Jour. Med. Sci. Ed., vol. ii. ‡ Merriman's Essay.

‖ Lond. Med. Jour., vols. ii. and xi.; Med. Observ. Inquir., vol. iii.; Mem. Med. Soc. Lond., vol. iii. Ed. Med. Comment., vol. xx.

§ Lond. Med. Fact. Observ., vol. iii.; Ed. Med. Annal., vol. iv.

¶ Ed. Jour. Med. Sc., vol. ii.

volume of the Lond. Med. Jour. formerly quoted, a case of retroversion is detailed, where, from its history, no one can doubt of its continuance for a month; yet, in this position, after the removal of thirteen quarts of urine, at two different operations, reposition took place soon after the catheter was used for the second time.* In another periodical, a case is recorded, where five pints of urine were removed by puncturing the bladder in the *linea alba*, *about two inches above the pubes*; and reposition happened the day succeeding the operation.† The object in puncturing the uterus is, to draw off the liquor amnii, and reduce the volume of the misplaced organ, that it may the more easily ascend above the brim. By the section of the pubes, it was intended to enlarge the upper strait, as well as the pelvic cavity.

As to the comparative merit of these three operations, the preference must certainly be given to puncturing the bladder. This mode of relief was first proposed by Linn,‡ and not by Sabatier, as incorrectly stated in the Diction. des Scien. Méd. The operation does not endanger life, nor has it been succeeded by abortion. Puncturing the womb, also suggested by Linn,‖ although repeatedly practised with success, must be attended with considerable danger to the parent, and be invariably followed by the expulsion of the ovum,—thus involving two or more lives. Although, from the experience of eminent practitioners, the subtraction of the urine will generally be followed by reposition of the uterus; yet cases may occasionally occur where it might not succeed, and where perforation of the womb might be indispensable. Where this organ has long remained misplaced, and has so increased in volume, that it cannot, even after emptying the bladder, be raised from the pelvis, while, as in Dr Wise's case, there is œdema of the legs, with serious constitutional derangement, I would not hesitate to puncture the uterus. In Mr Wall's patient, although retroversion was discovered in the fourth month, yet, so firmly was the uterus impacted in the pelvis, that it could not be disengaged, even after section of the abdomen, until the pubes was also divided. In Dr Wise's case, however, no sooner was the liquor amnii discharged, than the uterus, after cautious efforts, resumed its natural position, although the patient was seven months pregnant. Hence it is obvious, that a case may occur, where the patient will require both the bladder and womb to be punctured.

Before the latter of these operations, however, is deter-

* Ed. Med. Comment. vol. vi.
† Ibid.
‡ Med. Observ. Inquir. vol. iv.
‖ Dict. des Sci. Méd.

mined on, the position of the placenta should, if possible, be ascertained by the stethoscope, that we may avoid passing the trocar through that organ. Puncturing per vaginam should be preferred to that through the abdominal parietes when the uterus can be conveniently reached in the former direction; and we should endeavour to select the cervix. Besides enlarging the pelvic brim and cavity, section of the pubes has also been proposed, to secure the uterus, during its reduction, from injurious pressure, and thus prevent abortion. This is a grossly ignorant proposition. It may assist us in replacing the uterus; but, far from preventing, it will, assuredly, in almost every instance, occasion abortion. It was first proposed, for retroversio uteri, by Professor Purcell of Dublin, who probably borrowed the idea from M. Cigault of France, if not from Dr Hunter, the latter having adopted it in the dissection of Wall's patient. What was once, however, a mere proposal, has now become a precept; for Gardien recommends the pubic section as deliberately, as if he were speaking from experience.* But this operation, in many cases, produces permanent lameness: can never be required in retroversion of the womb; and M. Gardien, its greatest advocate, has not adduced one solid argument in its support. Previous to adopting even the best of the foregoing operations, persevering, but cautious manual efforts to reduce the uterus should have a fair trial. Some of the cases above referred to, prove that reposition was effected after reiterated attempts, and even many days subsequent to their retroversion.

Subtraction of the urine by the catheter, is the first object; and as some impediment may be expected in its introduction, the metallic will be found the preferable instrument. The position of the urethra and bladder is not so much altered, as to require any other than the instrument in general use. Nevertheless, as in *some* of the cases referred to, though the bladder was enormously distended, it could not be emptied by the catheter; and as some vesical secretion, or a deposition from the urine, probably blocked up the instrument, a long and capacious one should be employed. When once introduced, it should be retained till the uterus has resumed its natural position. The rectum is to be evacuated by occasional enemata, as being preferable to aperients by the mouth, which, by producing straining, tend to wedge the uterus in the pelvis. While the urine and fæces can be removed, we have generally speaking, little to apprehend; and therefore,

* Traité d' Accouchement, vol. i. p. 197.

a week, or even ten days, may safely elapse, before *manual* efforts at replacement be used; further delay, however, would be dangerous. A patient of a firm, vigorous habit of body, should be bled to syncope, before the attempt is made; but in the case of a delicate female, after waiting the time already mentioned, the only requisite is to place her in a position proper for natural labour.

Two fingers of the left hand, oiled, are to be advanced into the rectum; while the same number of the right, similarly prepared, are to be insinuated into the vagina. By those in the rectum, pressure must be applied to different points of the fundus uteri, and this part cautiously pushed up through the brim, rather laterally and anteriorly; while, of those in the vagina, the index is to be insinuated within, or hooked over the cervix, to replace it in its natural position. Although at the usual period of retroversion, the os uteri is sometimes so much dilated, as to receive the point of the finger, yet, a little higher up, the approximation of the sides of the cervix is such, as to obstruct the transit even of a common probe. This will show the danger of passing up an instrument to rupture the membranes,—a practice recommended when other means have failed; and considering the position of the uterus, this last must cause more injury to the parts of the patient, than puncturing its parietes; and as the fœtus must be lost by either, the latter operation ought to be preferred. In retroversion, whether in the early or latter months, if a finger can be introduced into the os tincæ, to draw it into the pelvis, I am satisfied, from experience, and by the successful practice of Dr Wise, that both reposition of the womb, and delivery, may be greatly accelerated, without injury to the uterus, by the manœuvre I have recommended. Dr Wise, by hooking his finger over the presenting foot, and drawing it into the pelvis, must, at the same time, have so favourably changed the position of the os uteri, that the delivery was *forthwith* accomplished. The late Dr Merriman, on the other hand, in a case almost similar, was advised to trust to nature, and the patient was nearly *six days in labour.**

Ante and retroversion may be met with in the unimpregnated state; but *except* when occasioned by disease of the uterus itself, or by tumours intimately connected with it, I have yet to learn that mere malpositions will cause in a female who is not pregnant, any functional derangement. When these

* Merriman's Essay, p. 28.

displacements result from disease, it is obvious that mechanical contrivances, unless the cause can be removed, to effect the reposition of the uterus, can only benefit the practitioner.

Extra-Uterine Pregnancy.—When the ovulum is not transferred into the uterus, but remains, and is developed in the ovary or while attached to it, in connection with this last organ and the Fallopian tube, detained in the canal, or is partly lodged in the latter and in the uterine cavity, the gestation is appropriately styled extra-uterine; to which term an adjective is added to designate the organic relation or locality of the product. Thus we may accordingly have four varieties, ovarian, ovario-tubal, tubal, and tubo-uterine gestation. The ovario-tubal, and tubal are frequent, the ovarian are next in point of frequency, while the tubo-uterine occur but rarely.

The reality of *ovarian gestations* has been denied, but their occurrence is as well established as any fact in pathology. It is contended that the ovary cannot become the cyst of the ovulum, since the Graafian vesicle on being fœcundated and undergoing a certain degree of development, bursts from the organ which contains it, and its contents are received into the corresponding Fallopian tube to be conveyed to the uterus. The best reply to this objection is, that in many instances, ovula have not only been found cohering to, but actually imbedded in the deeper structures of the ovary, and that too by men whose accuracy as anatomists could not be called in question.* This variety has been met with in single women as well as in matrons. Of 26 cases more or less minutely narrated in the author's memoir, six of this number are stated to have happened in unmarried females. The ovum or fœtus may be retained in the ovary for periods varying from one to nine months, or even longer; and during its retention the patient may conceive again, so that there may be contemporaneous uterine and ovarian gestation.

Ovario-tubal gestations are probably as frequent as any of the varieties. The cases which we have been accustomed to style abdominal pregnancies, ought to be referred to this division; for the notion of an abdominal gestation must be an absurdity. If, as has been assumed by some pathologists, the fœcundated ovulum immediately after its separation from the ovary, were to escape among the abdominal viscera, its development would cease, and it would become blighted, because it is not in connection with a mucous structure to af-

* Boehmeri, Observat. Anat. Rac. Fascic. I. Transac. Lond. Coll. of Physicians, vol. vi. p. 414. Phil. Trans. vol. cxi. p. 107.

ford it supplies of nutriment; and, *secondly*, because the peritonæal sac is not its natural residence, but the Fallopian tubes temporarily, where its development not only commences but may be perfected, since there are numerous cases recorded where fœtus in various stages of growth have been found in these channels. The ovum or fœtus in this variety may be retained for periods varying from a few months to more than half a century; and during the retention of the extra-uterine fœtus, the patient may again repeatedly conceive.

Tubal gestations are very frequent, and the left contains the ovum somewhat oftener than the right. The ovum or fœtus is not so frequently brought to maturity in this as in the last variety; but the product of conception in tubal cases has been retained for periods varying from two to forty-six years; and the patient may, in the interim, conceive.

The *tubo-uterine* variety are so rare that only six illustrations have been recorded.

The *symptoms*, in occasional instances, do not differ remarkably, if at all, from those of natural gestations. Some females have enjoyed uninterrupted good health to an advanced stage, or indeed to the close of a period equal in duration to that of ordinary pregnancy; while others have been considered as suffering from retroversio uteri, from some disease either of this latter organ, or of one of the ovaries. In other examples, and which may be considered by far the most numerous, symptoms the most distressing arise at an early period, and continue more or less constantly during the retention of the ovum or fœtus, as, for example, pains in different regions of the abdomen, sometimes so intense as to excite syncope, or even convulsions, and to be incontrollable by the most powerful doses of opium.

The catamenia may or may not be present; they may appear regularly in the early months, or at uncertain periods; and they may be limited or profuse in quantity. In some instances, at uncertain periods of the gestation, there are hæmorrhagic uterine effusions, the extrusion of coagula, of bodies resembling moles, or portions of the placenta; which appearances have led to the belief that such patients had aborted, that the ovum was originally not extra but intra-uterine, and escaped through a rent in the uterus into the peritonæal cavity. The mammæ enlarge, an areola is formed, the patient may or may not suffer from morning sickness, and quickening takes place at the usual period. In studying the symptoms, we must consider whether the tension or tumefaction *commenced* towards either side of the abdomen; and whether the uneasiness, if there be any complained of,

and fœtal movement, be confined to the same region as the swelling. We are also to remember, that in a large majority of the cases, the various ailments of the patient are more severe than those of natural gestations. The complaints may be either functional or structural. To the former belong vomiting, diarrhœa, constipation, dysuria, or obstruction of the flow of urine, all arising either from mechanical influence, or some morbid change. Among the symptoms dependent on structural derangements, excruciating pains at the umbilicus, in either iliac or lumbar regions, or near the pubes, may be mentioned.

Per vaginam we must study the position and size of the uterus, as also, if there be any other body in connection with it, as must be the case whether the gestation be ovarian, tubal, or contained in an adventitious cyst. If the os uteri cannot be reached at all, or with difficulty, the cervix in its unimpregnated state, and the uterus in its ungravid condition, though gestation be far advanced, or the patient actually in labour, a practitioner could scarcely mistake the nature of the case. Although, with some rare exceptions, the uterus increases in size, yet I believe there is no case in which it has been found to equal that of the gravid organ in the fifth month. Instead of the womb being elevated in the brim, it has in some rare instances been pushed so low into the pelvis that its cervix has protruded beyond the os externum.

In the *Ovarian variety*, impending laceration of the organ is characterized by a previously impaired state of health, varying in duration; sanguineous effusion per vaginam; universal languor and debility, approaching to syncope; abdominal uneasiness, sometimes circumscribed swelling with pain, which last is at first confined to the situation of the affected organ. The pain does not become suddenly severe; and generally it may be protracted from one to several weeks, or even months. Fatal event in ovarian cases is preceded by insupportable tenesmus and difficult micturition; and in all the varieties as well as the present, by severe gastric irritation, convulsions, collapse of the features, and universal prostration.

Ovario-tubal pregnancies may be suspected by the patient, towards the close of the gestation, having felt severe fœtal struggles, followed by cessation of motion; straining efforts resembling those of labour; reduction of abdominal tumidity; engorgement of the mammæ; discharges of blood per vaginam; re-establishment of the catamenia; and, finally, the perception of a sound having been audible in the abdomen.

The foregoing phenomena also indicate the extinction of fœtal life.

In *Tubal gestations* the crisis is marked by the abdominal uneasiness supervening suddenly, violently, and uncontrollably,—most frequently when the patient is in the enjoyment of perfect health. The pain extends towards the umbilicus, in resemblance of a severe form of colic, accompanied by a circumscribed swelling, a sense of fulness in the affected side. The pain supervenes more rapidly in tubal than in ovarian cases; but they are rarely accompanied by the distressing tenesmus and sanguineous effusions of blood per vaginam which characterize the latter. Sometimes a rigor is perceived; a countenance naturally florid and animated becomes exsanguined and ghastly; the pulse accelerated and feeble; the abdomen tense, the surface generally imbued with cold clammy perspiration, a constant feeling of, or frequently actual syncope, and finally a short interval of mitigated sufferings. The relief, however, is but treacherous, for the pulse becomes intermittent, and extreme anxiety, spasms, and delirium succeed; but sometimes the patient is conscious of her approaching dissolution, which happens after a period of suffering varying from five hours to three days. In some very rare instances there is no pain, the only symptoms present being such as are characteristic of extreme depression of the vital powers.

The *Tubo-uterine variety* are distinguished by a combination of the symptoms which characterize ovario-tubal and tubal gestations.

The causes are, it must be conceded, a most obscure subject for investigation, or, as we have on a former occasion been told, incapable of satisfactory elucidation. Misplaced gestation, of whatever variety, may be referred to morbid alterations of structure in the reproductive organs of the parent, congenite pecularities in their formation, mental emotions, and diseased changes in the tissues which compose the ovum itself. The ovaries, it must be confessed, are prone to chronic inflammation, which may be viewed as a predisposing state by the morbid action extending to the structures of the ovulum, or even to the Fallopian tube itself, while this organ and the ovary are in contact; and thus lay a foundation for one or other of the three first varieties. Morbid conditions of the tissues which compose the ovulum may be enumerated among the predisposing causes. As the structures of the ovum are found in a state of disease at the various stages of pregnancy, it is but reasonable to infer, that some pathological changes may originate with the ovulum, which, consequently,

in its transit towards the uterus, might lead to its contracting an adhesion with the tube. The naturally contracted calibre of these canals has been long admitted as a predisposing cause of the tubal variety, and thought satisfactorily to account for their frequent occurrence. These tubes, from their becoming gradually narrower as they approach the uterus, it will naturally be supposed may be readily obliterated, either at a particular point or throughout their whole course, by the most trivial engorgement of their inner lining, and thus constitute a cause which must be admissible.

When an opportunity is afforded of examining the reproductive organs at an early period of infancy, a bifurcated formation of the uterus, as is natural to the female of some of the lower animals, is manifest. Breschet has constantly, and I have myself occasionally, remarked this disposition. Bœhmerus, Morgagni, Garnier, Dumeril, and others, have noticed this formation in the adult subject. The knowledge of this fact enables us to account for the fourth variety, or, for those cases in which the ovum is contained partly in the bifurcation and partly in the uterus.

Although there cannot be a doubt of the presence and influence of the alleged pathological changes, yet from the occult manner in which some parts of the interesting process of ovology are conducted, we may never have ocular demonstration of some of the causes. It would, therefore, be hazardous to speak confidently on a point so intricate and obscure; and since, moreover, imperviousness of the Fallopian tubes might take place subsequently to the misplacement of the ovulum. The ovaries and fallopian tubes, but especially the former, are liable, it must be remembered, to morbid changes from constitutional predisposition; and both sets of organs are also frequently exposed to irritation, in consequence of their intimate connection with, and being concerned in the same function as the uterus,—an organ which, of all others in the female economy, particularly during the reproductive period, is more or less constantly under the influence of powerful excitement, arising either from ordinary mental causes, or those of a delicate nature.

There is reason to believe that the ovaries may be affected with chronic inflammation, independently of constitutional predisposition or uterine influence, and while similar changes are going on in some other organ, as the lungs, liver, and kidneys, under all of which circumstances individuals have been known to conceive. When the ovaries are the seat of disease, there can be no reason why the morbid excitement might not extend to the structures of the ovulum, and thus

lead to its detention in the diseased organ, or in connection with it. Sir Everard Home and Mr Stanley have recorded cases which satisfactorily support this position.*

In some instances the patient has been suffering from impaired general health for a considerable period before, or at the time when the misplaced gestation must have taken place. Occasionally where the ovary has been alleged to constitute the envelope of the fœtus, the corresponding organ has been found diseased. The same law is sometimes observed to hold good in regard to the ovaries, as to the eyes and other organs, though by no means so readily, viz. that the sound one is apt sooner or later to participate in the same change which affects the diseased organ. It has occasionally also happened that sterility, or one or other of the varieties of extra-uterine gestation, has succeeded to one or repeated abortions, a premature labour, or a delivery attended with much suffering, favouring the opinion that some consequent organic change had ensued, and at a subsequent period led to the misplacement of the ovulum.

Although in *Cyprians*, who are rarely productive, we are afforded a satisfactory illustration of the influence of undue indulgence in hymeneal pleasures in deteriorating the reproductive function, yet our knowledge of the structural changes inseparable from such a state, is limited. In females of easy virtue, and occasionally, also, in chaste women, one or both of the Fallopian tubes have been found cohering by their fimbriæ to the anterior or posterior surface of the uterus, or broad ligaments, whereby they would be prevented embracing the ovary, when the performance of this part of the function should take place. It is not, of course, to be supposed that this state of the tubes would be productive of any other result than infertility; but on observing such remarkable effects, I presume the inference would be quite legitimate, that the cause which had led to them might occasionally also have been productive of other structural changes, sufficient to account for some variety of extra-uterine gestation. Although I would by no means wish to be understood as positively affirming in what the disorganization consists, or whether the ovary, ovum, tube, or uterus, is most frequently its seat, yet the following fact deserves to be noticed, viz., that of ten unmarried females, the subjects of extra-uterine gestation, six of the number have been of those considered ovarian, one tubal, and three ovario-tubal. One

* Phil. Trans. vol. cxix. p. 61; Transac. Coll. Physicians, Lond. vol. vi. p. 414.

of the ovarian cases, and of which the pathological account is everything that could be desired in point of accuracy, was an individual who had practised her avocations as a Cyprian for twenty years. In support of the influence of pathological changes, it is further to be observed, that misplaced gestations have been most frequent, not among the youngest class of individuals, but in those somewhat advanced in life, especially females who have borne several children. As first impregnations they have only happened in the proportion of one to seven or eight subsequent births.

Of all the circumstances which have been supposed to conduce to misplaced gestation, mental emotions on the part of a female during sexual congress, is the most inexplicable in its operation; the fact, however, is not the less certain. In the author's memoir there are three cases related in which it would be difficult to deny the influence of this cause. A fourth instance is detailed in which a cow, immediately after sexual intercourse, had been gored by another animal; she died twelve days after the injury, when a tumour containing a vesicle was found implanted in the parenchyma of the left ovary; its membrane was opaque and strong, and inclosed a turbid puriform fluid.

The *Diagnosis* must be decided as promptly as possible, that such steps may be pursued as shall tend to retard a laceration of the envelope which contains the fœtus; and in determining the nature of any given case, there must be a strict analysis, not of any one symptom, but of all its most prominent features. If, after suppression of the menses and other phenomena of pregnancy for one or more periods, an individual were to be suddenly seized with uncontrollably acute pains in either iliac region, accompanied by a well-defined swelling at a corresponding point, sanguineo-mucous discharges *per vaginam*, frequent and painful micturition, tenesmus, and a sense of fainting, such ailments would warrant a practitioner in suspecting the presence of either an ovarian or tubal gestation, and impending laceration of their envelope. Were we to find the uterus elevated in the pelvis, connected with some foreign body, such a discovery might be considered as a corroboration of our suspicions. In a great majority of the histories of such cases, it will be observed that the cervix uteri was directed towards the pubes, and so much elevated in the pelvis, that it was to be felt with difficulty, or could not be reached at all.

There is no diagnostic of greater value than the cervix uteri, after pregnancy is considerably advanced, being found in its unimpregnated condition; and the body of the organ,

when it can be reached, being felt in a similar state. Should, on the other hand, no part of the uterus be within reach, while movement, however, is not only distinct, but the fœtus itself indeed felt through the abdominal parietes, these discoveries ought to confirm our suspicions of the presence of extra-uterine pregnancy. In connection with the foregoing remarks, we must not overlook, especially in advanced gestation, the importance of occasional paroxysms of acute pains in different regions of the abdomen as very characteristic of misplaced gestation.

From retroversion of the uterus, with which it has occasionally been confounded, it may be distinguished by the evacuation of the bladder and rectum, though accomplished with pain, being at no time obstructed, by the pelvic cavity being very seldom completely occupied, and the uterus rarely misplaced. Ovarian disease, or some other morbid growth, acute or chronic, might at first mislead a practitioner; but the entire absence of the signs of pregnancy must speedily undeceive him.

The *prognosis* in gestations of this nature, owing to the severe and often protracted sufferings of the patient, should always be guarded. The danger is greater in the early than latter stages of such pregnancies; for under the former circumstances the hæmorrhage will be more profuse, as there will be less impediment to its flow, when a breach forms in the envelope of the fœtus. Ovarian and tubal cases are attended with greater risk than either of the other varieties, from their cyst being prone to early laceration. There can be no doubt, however, that patients have recovered, even where the cyst had given way in the early stages of pregnancy.*

Violent pains returning by paroxysms in different regions of the abdomen are evidences of inflammatory action, and require a cautious prognosis; as also hæmorrhage from the rectum, or from the vagina; the protrusion of a portion of intestine in either of these directions, or through a breach in the abdominal parietes; and sudden sinking of the living powers. A very guarded prognosis is required where the opening in the abdominal parietes has been extensively dilated; gastrotomy performed before fœtal life has become extinct, or the excitement inseparable from pregnancy has subsided; where inflammation of some of the structures involved has arisen from external injuries, or undue exertion; and where hectic fever is established.

There is room for a more favourable prognosis when, by

* Author's Memoir, p. 126.

the suppurative process, a breach has been established in the walls of the abdomen, the rectum, or the vagina, for the evacuation of the decomposed structures. Females of a sound constitution, and among the industrious classes, have a better chance of recovery than those of feeble stamina, among the higher orders, or suffering from any organic disease.

The *termination* of misplaced gestation is, most frequently, by the formation of a breach in the envelope of the fœtus, and sudden death from profuse internal hæmorrhage, especially in the early months. This result may be hurried on by undue action of the abdominal muscles during the performance of any function in which they may be concerned; and injurious pressure upon the abdomen, from blows or other causes. The breach in the cyst may arise from inflammation and consequent sloughing, or from laceration, the effect of attenuation of its parietes by the pressure of the ovum, and its development, unlike that of the uterus, not keeping pace with that of its contents. In some of those cases, from four to six, or even eight pounds of blood have been found in the abdominal cavity, which satisfactorily accounts for the sudden and fatal catastrophe. As already remarked, the ovary and tube are more prone to early laceration than a cyst of adventitious formation, such as that of ovario-tubal pregnancies, a difference which the author will not pretend to explain.

Some cases terminate unfavourably, in consequence of the protrusion of some abdominal viscus through the breach, spontaneously established for the transit of the decomposed structures; and other persons die from exhaustion or hectic fever, the result of protracted irritation.

When the patient survives rupture of the cyst, the termination will depend on the degree of irritation excited, the treatment the case receives, and the prudence of the patient. The individual is sometimes preserved by a natural process, viz. the closure of the breach by an effusion of lymph or blood, or the cohesion of its surrounding inflamed surface to some adjoining structure. In other cases the extra-uterine fœtus and its cyst, after undergoing various changes to be hereafter noticed, continue in the abdomen with scarcely any inconvenience, for the natural duration of the life of the patient, who, while they are retained, may repeatedly not only conceive, but even be delivered with safety. When the fœtus and the other parts of the ovum have been dislodged from their envelope, the ambient structures may be seized with inflammation, which, with hæmorrhage, may destroy the

patient; or the excitement may assume a chronic form, or be modified by treatment; or suppuration with hectic may ensue. In one or two instances the decomposed structures have passed into the bladder; some ovarian and tubal cases have terminated in dropsy; and the former of these varieties, in a confused mass in which a few only of the fœtal organs could be recognized.

In *post-mortem* examinations we almost invariably find a cyst, except in cases where the product has been long retained; and my belief is, that although we may not be able to discover it, yet one is always formed, and that its absence may be satisfactorily explained by a very natural inference, viz. that it has been destroyed by inflammation and its consequences. In form, the adventitious cyst resembles the gravid uterus in advanced gestation; it may contract numerous and distant adhesions—extending even to the liver and stomach; its external surface varies in colour at different points, from light to dark blue; it may be much attenuated, or be from several lines to half an inch in thickness; but in this respect different parts of it vary; it may be moderately firm, or much softened; and except where the placenta is adherent, it is not generally very vascular, though in some rare instances the vascularity of other portions also, has been very considerable.

When the ovulum is not lodged in, but merely adheres to, the ovary or tube, or has burst from either of these, or from the uterus, it is the general belief, that partly from the excitement which is natural to it, as well as from the irritation which its presence and progressive enlargement occasions in the surrounding structures, lymph is effused, and constitutes an adventitious cyst for it. In cases of long detention the cyst may be converted into a substance resembling adipocire, or into calcareous matter, stone, cartilage, or bone.

When an opportunity is afforded of examining the ovum soon after the extinction of fœtal life, the membranes, funis, and placenta are discovered, and under the same aspect as in ordinary gestations; in other cases again, these structures suffer decomposition very early, and portions of them only are to be found. Although the placenta may resemble the same organ in uterine ova, yet in other instances it is as thin as a membrane, and not very vascular; while occasionally it has been found very thick, and abundantly supplied with blood-vessels, contracting numerous and very distant adhesions. It may be very soft, indurated, or converted into cartilage, or bone.

The fœtus may be indifferently, or fully developed; perfect, or imperfect in its organization. Decomposition of structure is the most frequent change to which it is liable, which may happen in periods varying from a few weeks or months, to several years after the extinction of its life; and is accelerated where there has been a considerable quantity of liquor amnii, or much blood has been effused. In other cases, again, instead of the fœtal structures suffering decomposition, we find them, after the lapse of several years, in as perfect a state of preservation as if life had been extinct only one or two days, but what is equally extraordinary, some organs present the appearance of having continued to advance in their development after fœtal life has ceased. The fœtal structures have also been converted into a fatty substance such as has been found in sepulchres; or they may become callous, converted into cartilage, bone, or a petrifaction. Except in some rare instances, the uterus increases in size, becomes less compact in its structure, its cavity is lined with decidua, and the cervix and aperture are furnished with concrete mucus, and corpora lutea are formed.

The *treatment* may be referred to the following heads; *first*, retarding laceration of the cyst; *secondly*, moderating hæmorrhage; *thirdly*, the management after the extinction of fœtal life; and, *fourthly*, the emancipation of the fœtus. To fulfil the first indication, every act which tends to compress the adventitious uterus must be avoided as much as possible, as well as every variety of irritation whether mental or uterine. When uneasiness arises in any region of the abdomen, it should be promptly allayed by the local or general abstraction of blood, a full dose Sol. Op. Sedat. given thereafter, rigidly abstaining from stimuli, and observing strict quietude.

When there are symptoms of vital depression, a sense of sinking, and of fluctuation in the abdomen, measures are to be adopted for accomplishing the second intention, as abdominal compression to as great an extent as the patient can support, the application of intense cold to the abdominal parietes, the internal exhibition of the Acetate of Lead and Opium in large doses, while artificial heat should be applied to the extremities, and the head of the patient depressed.

The steps for fulfilling the third indication are such as shall prevent inflammation and abscess, since while these can be averted, the dead fœtus, as already noticed, may remain in the abdomen of its parent, not only without abbreviating the natural duration of life, but even without interfering with any function. To attain the object in view, the patient must

avoid all active exertion, constipation, every cause of excitement, lead a life of retirement, observe abstemious habits, and *promptly* adopt efficient means for subduing abdominal uneasiness.

The emancipation of the fœtus, or gastrotomy should not be attempted until the system of the parent is restored to its unimpregnated condition, or the excitement inseparable from gestation subdued, and nature has evinced a disposition to remove the decomposed fœtal structures. When the suppurative process is established, or a breach is actually formed in the parietes of the abdomen, experience proves that these may, with safety, be largely incised, or the pre-existing aperture freely dilated, with almost certain success. In support of these principles, it may be stated that of thirty instances in which gastrotomy was performed, or the breach dilated under the foregoing circumstances, 28 of the patients recovered. Of 12 cases in which the same operation was adopted after the suppurative process was well advanced, ten were successful. The result however, has been diametrically opposite where gastrotomy was resorted to during the existence of fœtal life, or soon after its extinction; for of nine women operated on, none recovered.

When a head, breech, or foot can be distinctly traced through the vaginal parietes, the section of these with a view to the preservation of the mother and child, promises to be more successful than an incision through the walls of the abdomen. And as, from the cyst cohering intimately with the peritonæum of the pelvic brim, we at once, by an incision through the walls of the vagina, enter the sac which contains the fœtus, this must be a much more eligible operation, in the cases particularized, than gastrotomy, by which we unavoidably expose the whole peritonæal cavity. In nine cases in which the vaginal incision was practised, three mothers and their children were preserved; in two instances the mother only, recovered; on one occasion the child only, was saved; and after three operations, both the mother and child perished. From these statements it is evident that except where the vaginal incision is eligible, nature must be left, in a great measure, to her own resources.

The section of the abdominal parietes is justifiable, and ought certainly to be adopted whenever the fluid contents of the abscess approach the surface, and the higher degree of excitement attendant on suppuration has nearly subsided; or should the abscess have burst, an early opportunity must be embraced to enlarge it. The situation, extent, and direction of the incision must be left to the judgment of the prac-

tioner; and should hæmorrhage arise during its performance, it must be treated on general principles. During the protracted, and often profuse discharges of pus, the system must be supported by tonics, generous diet, cordials, country residence, and strict attention to cleanliness. As, during the suppurative process, the placenta, except in some rare instances, is removed from the abdomen with the other decomposed structures, this discloses to us the important fact, that the retention of the mass may be permitted without any detriment to the patient; while it can scarcely be doubted that the irritation produced by groping for it among the abdominal viscera would be productive of serious consequences. Should the decomposed structures be passing by the rectum or vagina, these canals must be kept free by injections of water, or Infus. Anthem. Nob., in a tepid state.

For a fuller exposition of the principles inculcated on this subject, numerous illustrations, and many references, the author's memoir may be consulted.

Diseases of the Placenta.—As these are occasional causes of abortion, it is to be regretted, that our present means of diagnosis afford us almost no assistance in determining that a pathological condition of the placenta exists, until, after it has been thrown off from the uterus, we come to examine it as an interesting piece of morbid structure. Its diseases are of three kinds, degeneration, inflammation, and apoplexy. The first of these comprehends moles and uterine hydatids, both of which have been already treated of in a former portion of this work.

Inflammation of the placenta, or placentitis, may attack any part of the organ, either its substance, or its uterine, or fœtal surface, and may be either acute or chronic. When examined at an early period of acute inflammation, the affected portion of the organ is observed to be much heavier, and of a darker colour than natural, which is caused by the congestion of the part, and the effusion of serum from the distended vessels; if the inflammation has proceeded farther, and the diseased portion is cut into, it presents appearances similar to a lung in a state of red hepatization, and a considerable quantity of turbid serum exudes from the incision. The next stage in placentitis—the effusion of coagulable lymph—is the one with which practitioners are the most familiar, as it gives rise to that troublesome and dangerous class of labours complicated with adhesion of the placenta. In those cases the uterine surface of the organ has been inflamed, coagulable lymph thrown out, and connection to the uterus formed. It is rare that the whole, or even a large

portion of the placenta, is attached, the adhesions being in general merely small scattered points, sometimes at the centre of the mass, and at other times on the circumference. When, from the effusion of lymph into the substance of the placenta, we find portions of the organ indurated, the inflammation has been of the chronic character, the parts affected possess the consistence of cartilage, are of reddish grey or yellow hue, and occasionally lardaceous or stearoid in structure. These various terminations of placentitis have given rise to the supposition that the placenta is subject to cartilaginous, scirrhous, and steatomatous degeneration. Most frequently this induration is limited to one or two cotyledons of the placenta; at times, however, it extends much more widely, until a half, or even a greater portion of the mass, is involved; the function of the organ may then be destroyed, and abortion be the consequence. The lymph is occasionally found soft, flaky, and disposed to layers, showing that it is of recent formation. Cases have also been observed where placentitis has terminated in suppuration. M. Brachet relates one instance where three-fourths of the organ were occupied by an abscess, containing a wine glassful of purulent matter; and Cruveilhier records a case in which the placenta was studded with small abscesses, varying in size from a pea to a nut, each encircled by hepatized structure; several, or even all of these different stages of inflammation, may be observed in one and the same placenta.

Various external circumstances have been alleged to excite placentitis, as falls or blows on the abdomen, tight lacing, and carrying heavy weights; in others, mental distress, or fright; but in many cases no assignable cause could be traced.

In considering the histories of the recorded cases, the most frequent symptoms of placentitis appear to be, pain in the uterine and lumbar regions; sometimes merely a dragging sensation is complained of, and if, upon the application of the stethoscope to the abdomen, the situation of the placenta is found to correspond to the seat of the pain, our conjectures as to its cause may be in some degree strengthened. It has also been observed by Naegelè, that when this organ is diseased, the placental *bruit* is abnormal, and possesses somewhat of a piping, or whistling character; besides this pain, slight fever and shivering have been observed. From these remarks it is evident, that the semeiology of this disease is exceedingly obscure; and as these symptoms are characteristic of many other affections besides inflammation of the placenta, our diagnosis will savour more of hypothesis than of certainty. Should we, however, in any case believe that we

have determined the presence of placentitis, general or local bloodletting, and other antiphlogistic means are indicated, as the rational method of prevention or cure.

In treating of placentitis, I stated congestion to be the first stage of that disease; but there is another affection of the placenta, of which congestion is also the primary condition. This is termed by Cruveilhier placental apoplexy, by others placental ecchymosis; the first of these is incorrect, but pathologists have been so long in the habit of affixing the term "apoplexy" to effusions of blood into the structure of any internal organ, that the impropriety of its application is not perceived. We are not as yet acquainted with any tangible distinction between that species of congestion which runs on to inflammation, and that which terminates in extravasation; it has, however, been observed that the inflammatory congestion of the placenta is confined to one or two of its cotyledons, or perhaps one lobe, whereas the non-inflammatory occupies the whole organ. The reason of this is probably, that in the one case the cause of the affection is more local; in the other it is constitutional, and must be sought for in some derangement of the circulatory system of the mother or fœtus, the placenta being in itself merely passive, and exerting no active influence whatever on the momentum of the circulation. On examining a placenta affected with non-inflammatory congestion, we find it much increased in weight and size, a dark violet or livid colour pervades its surfaces and substance, and its vessels are gorged with blood, this gradually increasing until sanguineous effusion is the result.

Extravasation may take place into any part of the organ. It has been seen situated on the fœtal surface, immediately beneath the chorion and amnion, forming an elevation the size of an egg; and I have lately, through the kindness of my friend Dr Adams, seen an instance of it in the same situation, between the chorion and amnion. Again, it has been found betwixt the uterus and placenta, the entire margin of the mass cohering to the uterus, in such a manner as to form a sac for the reception of extravasated blood; and lastly, sanguineous coagula, varying in size from a pea to an egg, have been observed in the substance of the organ. When the effusion takes place at an early period of pregnancy, it is frequently extravasated between the decidua and chorion, which, together with the amnion, it causes to project into the cavity of the latter. When the coagula have remained effused for some time, they gradually lose their colouring matter, until nothing remains but the whitish or

straw coloured fibrine of the clot, somewhat indurated; and being then considerably smaller than the original size of the coagulum, they are surrounded by loose sacs; these, as they are frequently small, and numerously scattered through the placenta, are probably what writers have termed tubercles of that organ.

Placental congestion may be dependent on derangement of the circulating systems, either of the mother or of the child. Any circumstance which tends to obstruct the free return of the blood from the placenta, or to increase its momentum, either generally, or toward that organ particularly, will induce this state, as mental emotion, plethora, uterine irritation, and the extreme tenuity of the placental vessels, will render extravasation a probable occurrence, especially if physical violence has acted in conjunction with any of the foregoing causes.

The symptoms of placental apoplexy are still more obscure and unsatisfactory than those of placentitis. There has been observed, pain in the lumbar region, in the thighs, and occasionally in the mammæ, an uneasy feeling of tension in the uterus, and it is stated that if placental congestion is of long duration, the morning sickness, and the other sympathetic affections of pregnancy, are increased in intensity. We have, however, no proof that extravasation has taken place, unless a sanguineous effusion appears externally; but even this is no certain sign of placental apoplexy, and the case becomes merely one of hæmorrhage before delivery. The proper treatment for congestion of the placenta would be local or general blood-letting, and strict antiphlogistic regimen.

Abortion.—By this term is to be understood the premature expulsion of the ovum, a process which we shall consider under the three distinct heads of early and late abortion, and premature labour; for the importance of the case, and its management will vary, at different periods of pregnancy. This is the most frequent accident attendant on gestation. The term *early*, may be applied when it occurs at any time during the first four months; *late*, when it happens betwixt this latter period and the end of the seventh month; and the expulsion of the fœtus during the last two months, may be denominated *premature labour.*

Abortion happens more frequently in the early than late months, in elderly delicate females than in those who are young and vigorous; in women who are resident in towns than in such as sojourn in the country; in persons who are of a spare habit than in those who are somewhat corpulent; and individuals who have had one or more abortions are

very liable to a repetition of the accident. In the early stages of gestation the uterus subsides more into the cavity of the basin, and hence is liable to be affected by the internal pelvic muscles concerned in moving the lower extremities, as well as by sexual intercourse. The causes of abortion are extremely numerous, and may be divided into predisposing and exciting.

In regard to the *predisposing causes*, it may be remarked that the human female is more disposed to abortion than any other of the class mammalia, owing to the erect position of her body, the greater delicacy of her frame, irritability of her nervous system, prevalence of her passions, and her liability to be acted on by moral causes. From the erect position of the body, the cervix uteri is continually exposed to the pressure of the ovum, and when in a state of relaxation may be forced; and this risk is increased by every function which excites the abdominal muscles, as laughing, crying, coughing, sneezing, straining, and a great variety of other actions. Among the predisposing conditions, plethora is insisted on; but although uterine plenitude may assuredly be considered as an efficient predisposing state, general plethora is not by any means frequently concerned. General debility is not so influential as some have supposed, since females advanced in phthisis often complete their time, though they sink in a few days or weeks after delivery. When an individual frequently aborts, this has been ascribed to the influence of habit on the system, which cannot altogether be denied; but since, by suspending for a time the procreative function, and affording an opportunity for the tone of the womb to be restored, premature expulsion may be prevented, it seems more consistent in such cases to attribute the accident to local or uterine debility. This state, with consequent plethora of the organ, is a general result, even where premature expulsion has only once happened, and very well explains why one abortion should pave the way for another. In spare females the uterine contents are freqently expelled prematurely, in the first, second, and even third pregnancy, in despite of every precaution, from the vascularity of the reproductive organs not being adequately developed, or the incapability of the system to furnish sufficient materials for the growth of this organ. Also females advanced in years previous to marriage, often have two or three abortions in succession, from diminished tone of the womb and ovaries, and then go to the full time, from the condition of the genital organs having probaby been improved by temporary excitement, and an increase of their fluids. In many in-

stances the predisposing condition is obscure, but as severe injuries occur to females without any uterine derangement, while the most trifling give rise to it in other cases, it is presumable that in every instance of accidental abortion, a predisposition, though not obvious, must exist. I have known the most severe ptyalism induced, and the most brutal violence inflicted on the person of the sex, with a view to induce abortion; I have in a second pared the neck of the bladder for the closure of vesico-vaginal fistula; in a third excised the nymphæ; and in a fourth I have known both thighs fractured without such cases being succeeded either by disturbance in the uterine system, or injury to the fœtus. I once delivered a woman, who, when four months pregnant, had even been operated on for fistula *in ano*, without any injury. Where the exciting cause is violent, whether its action be local or general, it may certainly lead to premature expulsion, without the presence of any predisposition. Some other predisposing causes on the part of the parent have been insisted on, but they are more imaginary than real. In this light we may view rigidity of the uterus. If this organ were unyielding as sole leather, such a condition could not be considered a cause of abortion; since, so long as the system continues to furnish materials for its growth, the organ will enlarge in a ratio sufficient at every stage to lodge the ovum. Individuals who are for the first time pregnant, are almost the exclusive subjects of rigidity of the uterus; but in them abortion is rare, whereas in those females who have had several children, the accident, on the contrary is not unfrequent.

Certain conditions of the uterus, fœtus, and secundines conduce to abortion. Organic lesions are viewed in this light, but they are not so uniform in their influence as has been supposed. How often, for example, do females conceive and bring the ovum to maturity, though the uterus be scirrhous or contain a polypus? Cases are frequently met with, where, from the contamination and consequent death of the fœtus by syphilis, premature uterine action comes on. The same, indeed, is sure to be the result, by whatever cause it may have been destroyed; for it is a law in the economy of the gravid uterus, that whenever gestation is interrupted, whether by the system withholding the materials required for the development of the ovum, or by the destruction of the fœtus itself, the womb sooner or later rids itself of its contents, and this disposition cannot be arrested. So long however, as fœtal organic disease, whatever this may be, does not originate in parental influence, or suspend fœtal exist-

ence, gestation may be completed; and of this we have a satisfactory proof in congenite hydrocephalus; to which no case of abortion or premature labour that I have myself seen or heard of from others, could be attributed. Nor does syphilis, indeed, at all times induce premature uterine action, though from the child dying, or exhibiting unequivocal evidences of it at birth, or in a few days or weeks thereafter, there cannot be a doubt of intra-uterine contamination. The implantation of the placenta over the os and cervix uteri, very often in the later months, induces premature uterine action. The same influence has been ascribed to diseased structure of the mass, as induration and ossification; but although both are of frequent occurrence, I cannot particularize an instance where abortion could be attributed to either; and yet, in some cases, I have seen the greater part of the placenta converted into cartilage or bone. A hydatiginous condition of the membranes, and a varicose state of the funis, have been considered as predisposing causes. The latter I have often seen in healthy living children, born at the full time; but *never except once, in a premature still-born fœtus.* I have never witnessed a hydatiginous state of the membranes. All these conditions, with the exception of implantation of the placenta, are unknown to us until after the expulsion of the ovum. Finally, the great delicacy of the utero-placental vessels, and the facility with which the mass itself is detached from the uterus, are efficient predisposing causes. Hence it happens, especially under circumstances either of general or local plethora, that these vessels are very liable to be lacerated simply from a slight increase of their own action, or from an augmentation of their contents and consequent over-distension of their coats. Local or uterine plethora is a most fertile cause.

The exciting causes, which are numerous, may exert their influence either directly or indirectly. Of those which act in a general way, I may particularize violent exercise, distressing mental emotions, poisons introduced into the general system, and acute diseases, as fevers, and inflammations. Among the local causes, drastic purgatives, excess in venery, hæmorrhoids, prolapsus ani, blows, and attempts to dilate the os uteri to procure abortion, may be mentioned. While the womb is in the pelvis, it may suffer injury from violent contraction of the pyriformes muscles. When it ascends upon the brim, it is exposed by the acts of walking, dancing, straining, or lifting heavy bodies, to the action of the abdominal muscles themselves, which, by their occasional contraction, press injuriously on the uterus, and excite its muscular

fibres into action, whereby a more or less extensive detachment of the membranes, or placenta even, results. When this separation is extensive, the ovum ceases to be nourished, and its premature expulsion is inevitable. The elevating or depressing passions are frequent exciting causes of abortion. In habits strongly predisposed, they have been known to act with a degree of rapidity incredible, except to practical men. Any sudden noise, as that of thunder, musketry, or artillery, is often no less sudden in its effects. During parturition, the practitioner has many opportunities of witnessing the liability of the uterus to be excited or diminished in its action, by mental passions.

With the intention of removing diseases attendant on pregnancy, remedies poisonous to the fœtus, are sometimes legitimately used, but they are also occasionally given with the base design of procuring abortion. Among these are, Digitalis and Mercury. The former destroys the ovum in two ways: *first*, by exciting and lacerating its vessels; and, *secondly*, by poisoning the fœtus. It is probable from the experiments of M. Magendie, that Digitalis, more especially in the liquid form, as Infusion, Decoction, or Tincture, is transferred from the system of the parent, into that of the fœtus. I know of several instances of premature uterine action being induced by this drug, given for the removal of dropsy. In one instance, the child was still-born, though the labour was quick; it was apparently mature, and must have been alive that day. The quantity of Tinct. Digit. taken by this woman in seven days, was five drachms and a half. There is, perhaps, another way, in which the full action of Digitalis, long continued, may destroy the ovum, viz. by diminishing the vascular and nervous energies of the uterine system. Mercury may have been ordered in the gravid state for syphilis; and though exhibited, even in the usual manner, it may stimulate the uterus to premature action. By a case already referred to in this chapter, we see that Mercury does not always, however, produce abortion, even when exhibited to a great extent; and from instances related to me on good authority, I can say the same of Digitalis; but I think they will both infallibly produce miscarriage, where there is predisposition. Fevers occurring in the gravid state, very often produce abortion; and inflammations, whether of the internal organs, or of the external surface, as rubeola, scarlatina, or variola, have a similar effect, either in consequence of general excitement, or of the uterine current being directed to other parts.

In speaking of the local causes, I specified drastic purga-

tives. These are too frequently given to procure abortion; and in a subject predisposed, they seldom fail to have this effect. Gamboge, Colocynth, and Scammony are dangerous agents; and Jalap, in a large dose, may be added. The injudicious administration of these, especially the three former, produces great irritation, and inflammation even, of the mucous tissue of the stomach, and alimentary tube, and the uterus is called into action by consent. These medicines, when given in an over-dose, also occasion violent tenesmus, which adds to their injurious tendency. Undue indulgence in sexual congress is alleged to be a frequent cause, but females recently married, and who are most liable to this excess, are not the most subject to abortion. In a case of great sensibility of the uterine system it may be admitted, but as a general position it is untrue. Hæmorrhoids, prolapsus ani, and blows on the sacrum or upon the hypogastrium, from the proximity of the injury to the uterus, act immediately on this organ. Blows on the abdomen, or sudden and violent action of its anterior parietes, often cause detachment of the placenta. Irritation of the os uteri, whether the result of remedies thrown into the vagina, or of attempts at dilatation, is liable to produce premature expulsion of the ovum. It is worthy of mention, however, that the influence of this irritation may, for some time, be limited to the aperture itself, or to the fibres in its vicinity; and what is more extraordinary still, the womb occasionally is so insusceptible of excitement, that the irritation may be of a violent nature, without being succeeded by uterine action. Profuse leucorrhœal effusions have been ranked among the causes, but they have little influence; for the linen of the patient, by excessive discharge, is often inundated without abortion or premature labour being induced.

The *symptoms* of abortion vary according to the particular stage of pregnancy, the frequency of the accident, and the habit of the patient. It is invariably preceded by uterine irritation, varying in degree, followed by disturbance in the nervous and vascular systems. Pains in the sacrum, extending along the perinæum and sacro-iliac symphyses, are, in first pregnancies, among the primary phenomena; these do not continue long, when effusion of blood per vaginam, cessation of the morning sickness, and flaccidity of the mammæ, follow. In a female who has formerly suffered more than once from a similar misfortune, or who is the mother of several children, a rigor, with an oozing of blood, unpreceded by any marked uterine irritation, but followed by deep nausea and fainting, mark the commencement of premature expulsion, and the

ovum itself shortly follows. The uneasiness and effusion are in proportion to the maturity of the ovum. And in a primary abortion, the suffering is more severe and protracted, than in an individual who has either had a miscarriage formerly, or borne children at the full term. In the first few days of conception there is little if any expulsive sensation; the principal phenomena are the sanguineous effusion, and pain in the back; but after the ovum has been received into the uterus, bearing-down efforts invariably attend.

Abortions of the early months consist, *first*, in the separation of the ovum; and, *secondly*, in its expulsion. After repeated impregnations, both these processes may be accomplished in a few hours; but otherwise, several days may elapse. The product of conception may present itself under a variety of forms, according to the term of pregnancy, and the time it has been retained after its detachment. When abortion is excited before the ovum has reached the womb, the only thing visible is a profuse sanguineous discharge, which coagulates, and in which we may or may not detect some pulpy flakes. When gestation is a little further advanced, the ovum may be expelled entire; but what much more frequently happens, especially after the second month, is the discharge of the liquor amnii; followed sooner or later by the fœtus; and shortly afterwards by the involucra. When the ovum has been retained for some days or weeks after its separation, it becomes putrid, and a grumous discharge sooner or later appears, in which the product of conception is gradually carried off in small portions. Occasionally, early in pregnancy, after fœtal life becomes extinct, the decidua continues for some time to be nourished, and the ovum is expelled in a blighted state, or converted into a mole. As in females who have been long barren, there is always much anxiety to learn whether they have been really pregnant or not, and as the ovum is sometimes so small as to escape the notice of the attendants, whatever is expelled should be preserved for inspection, that we may be enabled to form a correct decision.

Late abortion commences nearly like labour, by intermittent pains in the loins, extending along the sacrum and thighs, occasionally darting towards the pubes or centre of the abdomen. They are frequently preceded for several hours, and at times even for a day or two, by one or more rigors, but in other instances the former precede the latter; the mammæ and abdomen if previously enlarged, become less tumid; if the former have contained milk it recedes; the morning sickness, if present, subsides; and fœtal movement ceases to be perceptible. The patient has a feeling of weight in the

hypogastrium, and an increased flow from the vagina. Besides other differences, late abortion may be distinguished by the expulsion of the ovum being followed and not preceded by hæmorrhage as in the early months; the fœtus may continue several weeks *in utero* after death, without the patient being sensible of any peculiarity, except such as characterize the event. Sooner or later the pains become more urgent and stronger than those of early abortion. The liquor amnii, which is rarely noticed in the first months, is at last discharged; and the embryo shortly thereafter. In late miscarriage also, the effusion of blood, which continues from the expulsion of the fœtus until some time after the secundines have been removed, is greater than in early abortion; for this and the following reason, viz. that the involucra adhere firmly to the uterus, and are much more tardy in their separation than happens at the full time. Such cases require greater attention on the part of the practitioner.

In some instances, from over-exertion, and an irritable state of the uterus, a pretty copious effusion of blood takes place for two or three hours, giving rise to much apprehension lest abortion should follow, yet the patient goes to the full time. I have often known this happen after a long walk. When, in cases where there are twins, one of the number dies, it may either be expelled soon after, or retained to the full time. In an example where they were contaminated with lues venerea, the one, though some time dead, and even putrid, continued in utero until gestation was completed, when it was expelled with its apparently healthy, living companion, which also, six weeks after birth, presented well marked symptoms of syphilis. Finally, when effusion of blood shows itself per vaginam in a patient who supposes herself pregnant, or who is anxious to be thought in this state, when, perhaps, the obstruction is of a different nature, we must decide, by the appearance of the discharge, whether it be blood simply, or menstrual secretion, that a correct opinion regarding the case may be delivered.

By the *prognosis*, we have to determine the probability of saving the ovum. If the woman receive the necessary attention, we have little to apprehend for her safety, until after the close of the fourth month, unless she had suffered from previous bad health. Before this period the accompanying hæmorrhage, when the patient is under proper treatment, cannot, except under the circumstances stated, endanger life; for the vessels are not so large as to throw out so much blood, as suddenly to affect the system, though the loss of the ovum be certain. The most critical period at which

abortion can occur, is from the early part of the fifth to the close of the sixth month; for, during this time, the os uteri cannot sufficiently expand to receive the practitioner's hand, should the removal of the ovum be required; while, from the size which the vessels have now acquired, the effusion might shortly not only endanger, but actually destroy life. When it results from violence done to the uterus, whether accidentally from falls or blows, designedly by the internal exhibition of poisons, or by mechanical contrivances to dilate the os tincæ, the consequences are too frequently fatal. Abortions supervening to acute diseases may generally be considered as the harbinger of death. When it threatens in the early months, a guarded opinion must be delivered as to saving the ovum, since its placenta is small, delicate, and easily separated; whereas, when gestation is farther advanced, a portion of the secundines may often be detached, without any injurious effect. In spare, delicate females, those who have formerly suffered from the like accident, and such as are advanced in years, and in their first pregnancy, we can rarely suspend uterine action, be it ever so trifling. When the accident threatens in consequence of constitutional derangement, as that arising from fever, from internal or extensive external inflammation, the ovum can rarely be preserved, particularly in the early months. Though there be only oozing of blood at any period during the first three months, yet if there be the least dilatation of the os and cervix uteri, abortion is almost certain. Symptoms of the death of the fœtus suddenly supervening to any of the causes described, are also sure of being followed by miscarriage. In the latter, the chance of preserving the ovum is greater than in the early months.

The *management* of abortion may be considered under three heads; *first*, the mode of prevention when it is threatened; *secondly*, that of accelerating the expulsion of the ovum, when uterine action cannot be arrested; and, *thirdly*, the treatment to prevent its recurrence. In the first instance, when, in the early months, there are pains merely, without bearing down or uterine effusion, the case is favourable for arresting expulsion. With this view, if venesection be not contra-indicated, the patient should be bled to make a *moderate* impression on the pulse, and afterwards ordered from 80 to 100 drops of the Sol. Mur. Morph. If the case be one of the latter months, even slight hæmorrhage should not induce us to despair of success; for the ovum may frequently be preserved, and we must act accordingly; but we are rarely so fortunate under similar circumstances in the early

months. When plethora predominates, either in the uterine or general system, bleeding is doubly indicated. If, from general debility, it be inadmissible, leeches may be applied to the groins with advantage. Blood-letting, however, even in vigorous subjects, must not be carried the length of syncope, lest such relaxation might be induced as would favour, rather than prevent abortion; wherefore, it is better to repeat it than detract too large a quantity at first. Opium will be found a most valuable auxiliary. In a vigorous woman, the dose specified may be considered adequate; but in a delicate female less will suffice. Where uterine action threatens from violent excitement of the passions, this drug must be considered one of our most powerful agents; but the dose must be in a ratio with the degree of irritation. Whenever uterine action is suspended, a large dose of morphine solution should be furnished, that it may at once be taken, in the event of pains in the loins recurring. With these measures we must conjoin strict quiet and rest,—a recumbent posture,—free ventilation,—rigid antiphlogistic regimen,—and, as far as possible, abstinence from fluids. Liquids *ad libitum*, cannot be too strongly prohibited in any case, but particularly where plethora is the exciting cause. When there is troublesome thirst, as generally happens, it will be more prudent to allay it by articles which will not renew or increase plenitude, as stewed apples, grapes, or other subacid fruit. Circumstances productive of strong mental emotions, are sedulously to be concealed from the patient, from their tendency, in a habit predisposed, or where there is the least threatening, to hurry on abortion. The bowels are always to be kept free, were it merely to prevent straining at the commode. Where the accident threatens, if it be necessary to evacuate the intestines, nothing stronger than the common domestic enema, in moderate quantity, is to be used. When there is no cause for interference, however, all artificial irritation of the primæ viæ, however slight, ought rather to be avoided for a few days, until uterine excitement has been completely allayed. In every case, much may be accomplished by prudent conduct on the part of the patient, and those around her; while, without it, little can be effected by the most prompt and judicious management. How often has a trifling indiscretion, as indulging in a solitary glass of wine, or in a little animal food, counteracted all our efforts? Although we may have been successful, yet we should not fail to represent in strong terms, the facility with which relapse may happen; and that nothing but the strictest attention to corporeal and mental quietude and re-

gimen, can prevent the accident. It is also proper to state the injurious consequences of abortion, which often enfeebles the system, and lays the foundation for sterility, cancer uteri, and phthisis. These sequelæ are so very frequently observed that I am at a loss to understand how any man could declare that abortion produces "no injurious effect on the constitution of the mother."

When there is effusion of blood in the early months, and uterine action established, no consequence whether at this period or later, all expectation of preserving the ovum may be abandoned. In the next place, we must consider the mode of removing the ovum. On examination *per vaginam*, it may be so placed, as to enable us to remove it at once, which ought to be done. More frequently, however, we find the os tincæ very contracted, without any protrusion of the ovum, in which case we must delay until dilatation be farther advanced; and in the interim, carefully watch the case, and restrain hæmorrhage, lest it make too great an impression on the system. When the expulsion is tardy, and more particularly when uterine effusion is profuse, the patient must be assisted. If the os tincæ be fully dilated, the membranes should be ruptured, and thereafter the fœtus, with its involucra, may easily be hooked down by the finger. Where this cannot be accomplished without using too much freedom, the action of the womb can be promoted by ergot. Whatever method be adopted, instruments in every form should be dispensed with.

An anxious circumstance in those cases is, that the secundines are frequently for many hours, or even several days, retained, after the fœtus has been removed. While a patient is in this state, there is not only danger from hæmorrhage, but also from decomposition of the retained mass, from which formidable fever may arise. In such cases, ergot should be given internally, pressure applied to the abdomen, and a cathartic enema, occasionally exhibited, to promote uterine action, and to moderate effusion. For the first three days of placental retention, six ounces of tepid water should be injected into the uterus, every four hours; and after this period, a saturated solution of Alum, in the same proportion, and equally often, to prevent hæmorrhage, putrefaction of the secundines, and absorption of morbific matter.

Hæmorrhage in the early months, is frequently so trifling as to require for restraining it, little more than rigid confinement to the recumbent posture, few bed-clothes, a cool, well-aired apartment, and strict attention to the antiphlogistic regimen. After the fourth month, however, the hæmorrhage

is generally such, as to command greater attention, and to require more powerful measures. So long as the membranes remain entire, we have little to apprehend at this period, so that we avoid rupturing these, until the os uteri be fully dilated, and we can remove the whole ovum at once. Of the remedies which have been recommended for moderating hæmorrhage at this stage, cold applications are decidedly the best. In every case they will be found useful in diminishing both local and general excitement. In strong vigorous females, they may be used fearlessly; but in patients who have been reduced by any cause, we must particularly avoid producing too permanent an effect, or reducing the temperature of the body much below its natural standard, lest the system might not rally. Cold may be so managed, as to act either directly or indirectly on the uterus;—indirectly, by occasionally sponging the back, lower part of the abdomen, and top of the thighs, with cold water, and covering the external parts with a cold compress,—directly, either by injecting from four to six ounces of cold water frequently into the vagina, or by introducing snow or ice into that canal. This latter practice, in urgent cases, should be preferred. In the early months stuffing the vagina with soft rags, previously immersed in water and acetous acid, will be found a safe measure, combined with the binder. From having, more than once, witnessed the fatal effects of leaving the placenta too long in the passages, after the expulsion of the fœtus at the full time, I cannot agree in the safety of stuffing the vagina, or the plug, as it is called, in cases of the latter months; for however uniformly the canal may be filled, in a delicate woman, a quantity of blood, sufficient to sink her irrecoverably, may be effused in an hour or two without the knowledge of the attendants.

Thirst is urgent when the flow is at all considerable; but liquids are to be given cold, and sparingly. Fires should not be permitted in the lying-in apartment, nor more bed-clothes than are sufficient to keep the patient from shivering. The diet, under ordinary circumstances, should be dry, sparing, and simple. There are circumstances, however, of the last importance to be borne in mind, in which a modification of these directions are to be observed. The system, for example, may have been prostrated by hæmorrhage, before we have been called, in which case, some generous nourishment, and even cordials must be allowed: and while cold is locally used, one or two bottles of hot water, or hot irons must be applied to the feet or ankles. Venesection is decidedly improper at any period of gestation, when the ovum cannot be preserved.

Here every thing must be done to economise strength, that the patient may expel the ovum by her own efforts. Opium, in some form, is another remedy indiscriminately employed. When the accident threatens, a powerful dose will, in many cases, arrest expulsion; but under any other circumstance, its exhibition is improper. The last remedy I have to mention is Digitalis, recommended where flooding is protracted, and expulsion delayed. Although this medicine has been lauded by high authority, I nevertheless doubt both its utility and safety. Digitalis excites the circulation, increases hæmorrhage, and occasions nausea, which, in a patient previously reduced by flooding, may have serious consequences.

To remove the disposition to abortion, the *first* and indispensable step is to ascertain the causes of the accident; and, *secondly*, the predisposing circumstances. Of the latter, debility of the womb is the most frequent; and although this organ undoubtedly sympathizes occasionally with the general system, yet its tone is much oftener reduced by local, than by general conditions. A solitary abortion, or a severe labour, as already stated, occasions greater uterine prostration than any cause that can be mentioned; and where conception happens shortly after either, miscarriage is almost certain. General plethora is another cause, but less to be apprehended than local plenitude, which is sure to accompany uterine debility. Great susceptibilty of impression also strongly favours the accident. In all these conditions, more is to be accomplished by regimen than by medicine. A patient residing in town should retire to the country, that, by withdrawing from night dissipation, she may indulge in the advantages of pure air and exercise. The dwelling should be in an airy, dry, elevated position. In regard to exercise, walking is the most eligible, since it can be so easily proportioned to the strength of the patient. It must never be carried the length of fatigue one day, and neglected the next, as often happens, but be conducted with prudence and regularity.

With air and exercise we must conjoin local and general tonic remedies. None is more efficient than the cold bath. In the season, sea-bathing should be preferred, or if the patient dislike the latter, the shower-bath may be substituted. When there is no objection to sea-bathing, it may be used at any period of the day, unless it occasion shivering. Employed at the time the day is warmest, and using a single immersion, may obviate this inconvenience. Bathing may be continued notwithstanding the occurrence of conception, to an advanced period of gestation; but it must not be commenced *subsequent* to impregnation, lest a sudden influx of blood rup-

ture the utero-placental vessels. In a patient of delicate and susceptible habit, tepid water should first be used, and gradually brought to the frigid state. Such persons may not have strength for foot exercise, and should use an open carriage till capable of this exertion. In uterine debility, the cold hip-bath may be conjoined, morning and evening, with the general one; or cold water, to the amount of six or eight ounces, should be injected into the vagina two or three times daily. In this debility, it should be remembered, that if abortion has frequently happened, the party should be informed through the nurse, that sexual intercourse ought to cease, that impregnation may not occur until the uterine system be restored to vigour.

Abortion produced by syphilis, may arise from one or both parents being contaminated; and however it is to be explained, the congenite variety of the disease is now more frequent than formerly. The usual period of miscarriage from this cause, is the seventh month; and the fœtus may, or may not be born alive. When it is destroyed in utero, expulsive efforts must sooner or later supervene. We cannot well explain why the virus should induce premature labour, while the fœtus is yet alive. Before asserting that lues has caused the death of the child, the male parent should be privately examined, and if the investigation confirm our suspicions, the case must be represented to the mother, in a manner the least likely to disturb domestic comfort. We are not justified in declaring it to be syphilitic, from the mere vesication of the cuticle, as this may be the effect of long retention of the fœtus in utero, after life has become extinct. Separation of this tissue is a presumptive sign merely, but when abortion is frequently repeated, and the placenta larger, whiter, and softer than usual, strong suspicions may certainly be entertained of the existence of syphilis. In such examples, the case is to be further substantiated by a cautious investigation. Where the presence of this virus is confirmed, I can state, in opposition to all theory, that nothing but mercury can effectually remove the disease. In the gravid state, this medicine can rarely be administered in such quantity as to eradicate lues; and, indeed, it is safer not to attempt it, lest the uterus be prematurely excited. We must therefore be satisfied with exhibiting it merely as an alterative, until after delivery, when it should be administered to the necessary extent.

Where abortion has happened oftener than once, other organs suffer besides the uterus. The digestive apparatus is often affected; the appetite is greatly impaired, or if there

be any inclination for food, and the desire be indulged, an uncomfortable feeling for many hours is occasioned. Except in cases of much debility, neither vinous nor spirituous tonics should be used. In ordinary cases, a watery infusion Ras. Quassiæ, or Sulph. Quin. in the form of pills, will be found sufficient; or the aromatic sulphuric acid, much diluted, is very useful, and greatly relished. To aid the stomach in the healthy performance of its functions, it is scarcely necessary to insist on the bowels being duly attended to. For delicate females, Pil. Rhei C. is highly eligible. Where the subject is plethoric, and free action of the intestines necessary, a scruple of this mass may be ordered at bed-time, and three or four drachms of some Neutral Salt the following morning. The diet requires modification, according to the condition of the patient. A plethoric woman should be restricted chiefly to vegetables, with a limited allowance of lean, well-boiled animal food; no more liquid being permitted, than what is sufficient. Delicate females, and those susceptible of impression, are, on the contrary, to be ordered a liberal allowance of animal food, and two or three glasses of some mild wine daily; but like the former class, they must be particularly restricted in liquids. Much may be done to guard against the accident after the patient has conceived. Every uneasiness must be carefully noticed and quickly relieved, lest it may extend its influence to the womb. The greatest circumspection is required on the part of the patient herself, without which little benefit can be expected from the most judicious treatment. If the female be plethoric, she should submit to a detraction of three or four ounces of blood monthly, at the usual catamenial period. When, after the menses have disappeared, there is headache, flushed face, and palpitation, this practice should immediately be followed; but to such extent only, as shall make a *moderate* impression on the pulse. Every cause must be avoided, which tends to excite the arterial system; and the necessary steps adopted to subdue such a state when induced. The patient should avoid overheated apartments, crowded assemblies, night dissipation, visiting, and every circumstance which is apt either to elevate or depress the mind. In this state, exercise cannot be indulged in without great circumspection. The uterus, in some persons, is so easily excited, that until after the customary period of abortion, the mere effort of descending or ascending a stair is sufficient to cause the accident. If the patient can take the least exercise on foot, she should not expose herself to the jolting motion of a carriage, as there is nothing more likely to lead to miscarriage. Very often,

she must not only confine herself to one floor of the dwelling, but pass the greater part of the day recumbent, until the usual date of the accident has expired. Where the uterine system is irritable, sexual intercourse must cease from the moment the patient has become obstructed, and she must live *absque marito*, until after the critical juncture. Excitement must be prevented by rigid antiphlogistic regimen, and the limited use of fluids. And the bowels are to be so regulated by enemata, or the mildest laxatives, as to obviate straining. In persons who have acquired a habit of aborting, I have known much benefit arise from an Opium Plaster constantly worn on the sacrum.

PART FOURTH.

DISEASES OF INFANCY AND CHILDHOOD.

CHAPTER I.

THE EARLY MANAGEMENT OF INFANTS.

The inability of infants to describe orally, like subjects of mature age, the character of their ailments, has universally been considered by the younger members of our profession an insurmountable barrier to the attainment of correct notions of infantile pathology. Nor is this to be wondered at, when we consider that it is not quite a century since physicians of great eminence, when required to visit infants or children affected with disease, obeyed the summons with reluctance, declaring their incompetency to afford relief, since it was not possible either to understand, or to see down the throats of, those for whom they were required to prescribe. But as of late years our members have learned by experience, that it was fully as much to their advantage to study the living as well as the dead languages, as they are familiarly styled, we have accordingly made considerable progress in that peculiar to infants and children. It merely requires to be stated, when the fact will be at once conceded, even by the most superficial observer, that from the moment of birth our race possess the faculty of expressing the nature of their ailments, at least in two ways; *first*, by physiognomical changes; and, *secondly*, by functional derangements. By carefully studying the language of the features and of the functions, metaphorically speaking, we shall be able to determine not merely the cavity in which disease exists, and the nature of the derangement itself, but frequently also the very structure which is involved. Since the diseases of children are rapid in their progress, and as it is in their incipient stages only that active treatment can be adopted, an early knowledge of their nature must be of the first importance. As the diagnosis will be particularized in every disease of which we shall have occasion to treat, we shall not

enlarge on the subject at present, but proceed to consider the attentions required by infants at birth, which, superficially considered, would seem to be the province of old women rather than of the medical attendant. When we reflect, however, that the young of our race are the most helpless of all created beings, and that much of their healthy development in after life depends on judicious management in their tender age, their early treatment must be considered highly deserving the consideration of practitioners.

Ablution.—This is the first attention required by the infant. Generally, it is so clean at birth that this duty is easily performed; but occasionally, the body is thickly covered with a whitish unctuous production, styled *vernix caseosa*, and difficult of removal. For the first, and every successive ablution during the cold months, tepid water must be used until mild weather has set in, when the infant is gradually to be accustomed to cold water. Ablution is to be conducted with great tenderness, and particular attention paid to points where two surfaces are in contact, as around the neck, in the axillæ, and between the thighs. These parts should be bathed morning and evening, while it will suffice to wash the remainder of the body once daily. When cold water is used, a *single plunge* is preferable to protracted immersion, lest the child be chilled; and on withdrawing him, gentle frictions, by means of a soft dry towel, should be employed over the surface, until the natural heat be restored. Some children cannot support cold bathing; and one under my care, when immersed in cold water, was invariably seized with diarrhœa. Such infants, as well as those who continue long pale and dull after ablution, should simply be sponged with cold or tepid water near a fire. When the body is coated with unctuous deposit, its detachment is aided by anointing the surface with lard or unsalted butter, and thereafter using mild soap and water; but during the first ablution, the infant will suffer less from leaving a little of it behind, than from rude frictions, or protracted exposure. In cold weather, the room in which the child is washed should be warm, the ablution expeditious, and the young stranger clothed without delay. With sickly or delicate children, great caution must be observed in commencing cold bathing. In former times, the children both of the higher orders and industrious classes were washed in cold water from the time of birth to make them hardy. It is scarcely necessary to protest against a practice so barbarous, and now almost abandoned. Nevertheless when it is admissible, it forms one of the most simple but effectual means of invigorating the system.

Dress of infants.—This is the next object of attention. The head is the first part which nurses subject to ablution, and this being accomplished, it is covered with a flannel cap till the rest of the body be washed and dressed, when one or two cotton ones are substituted. *The belly band* is the next article: it is a flannel roller passed with moderate firmness once round the abdomen, over the umbilicus. As the formation of the parietes is incomplete at this point, and the lumbar is not so effectually supported as the dorsal spine, this may be considered a very useful appendage. Over this last is placed a shirt of fine cotton cloth, in preference to linen. The last of the under garments is an article termed *barrow*, which somewhat resembles a frock, open in front, and made of flannel. Besides these, the infant is furnished with a frock of light or warm clothing, according to the season of the year. The whole of the dress should be made wide, and much longer than the extreme length of the body and limbs, to afford freedom of motion; and so furnished with narrow tape, as to require no pins, which, however skilfully fixed, are often productive of considerable lacerations of the skin. Cleanliness in dress is no less necessary than that of the body, and the nurse should, by a supply of napkins, prevent the infant's clothes being wet or soiled. Among the children of the poor, the great mortality has, in numerous cases, no other cause than neglect of these precautions. The under garments should not be worn longer than a day.

Removal of the Meconium.—This is a dark greenish, viscid matter, partly generated in, and partly poured into the intestines from other channels. Its long retention not only produces severe griping, and occasionally even convulsions, but a portion of it is transferred into the blood, and causes icterus, in vulgar language termed *yellow gum*. Various means are used to evacuate this production, as a solution of muriate of soda, manna, or soft sugar in water; but a teaspoonful of cold-drawn Castor Oil, with a little warm water and sugar, immediately after the infant has been washed and dressed, is the most effectual. This practice will not only in a great degree prevent the appearance of icterus, but also strophulus and other affections of the skin, so prevalent in early infancy. At so early a period, however, aperients are not to be administered without the approbation of the practitioner, since their injudicious exhibition may be followed by worse consequences than the complaints they are intended to remove. When these are required, Manna, Magnesia, Castor Oil, Rhubarb, or an enema of warm water and a proportion of Olive or Castor Oil, according to the

degree of action it is wished to excite, will be found sufficient under most circumstances.

Training of infants to give warning of their calls to stool and urine.—This should be very early inculcated. If nurses watch the various actions of the child, except when suffering from disease, his clothes should rarely appear wet or soiled. In health even, the evacuation of the bowels is preceded by whining, restlessness, paleness, stretching, or straining, and frequently by the escape of flatus. When these signs are observed, the infant should immediately be encouraged to void the fæces either in the ordinary way, or by being placed in the nursery chair. When this duty is strictly inculcated, by the end of the second month he will possess sufficient intelligence to intimate his natural wants by signs. Placing him, when a little older, in the nursery chair, at stated periods during the day, or at the same time with other children of the family, the power of imitation at this early period is so great, that he will soon follow their example.

Nourishment.—For the first twenty-four, or even forty-eight hours, little nourishment is required by the infant. It is, however, necessary to apply him to the breast some time during the first day after birth, to encourage the flow of milk. Frequently this secretion does not show itself for one or more days after delivery, especially in a first confinement, and the attendants consequently think it unnecessary to apply the child until there is some indication of milk; but it should be explained, that suction of itself will encourage the secretion. Moreover, from the first milk being more acrid than what appears subsequently, it assists in the removal of the meconinm; but this ought not to supersede the practice recommended in the last subject.

Though the secretion be limited at first, it is in general proportioned to the wants of the infant; and in far the majority of instances, nothing more is required for the first six or eight weeks. When additional nourishment is given, aphthæ or diarrhœa, or both together supervene. In the primary confinements of delicate females in the better ranks, sometimes the supply of milk is not adequate, in which cases some artificial nourishment must be allowed the infant, and this should, as much as possible, resemble the natural secretion. Among the poor, I have only seen four examples of total want of milk; and the women were upwards of forty when first confined. When the supply is insufficient, which may be suspected by the mammæ being undistended, the infant being constantly discontented even after sucking, and his

not acquiring plumpness and solidity, some additional nourishment must be allowed. Cow-milk, in a proportion of three ounces to one of water, and about two scruples of refined sugar, will constitute something very much resembling human milk. It should be fresh from the cow, without adulteration with water. The mixture is not to be prepared until required, nor given to the child until it have previously emptied the breast, lest, preferring the former, he might refuse the latter, and the milk recede.

The artificial aliment may be given either by a tea-spoon, or sucked from the nursery bottle, which is the preferable mode. To the mouth of this bottle must be affixed an artificial teat of chamois leather, with a small bit of sponge within, to prevent the child obtaining the liquid too rapidly. The teat ought to be renewed daily, and the bottle kept clean. The quantity required is to be determined by a due observation on its effects; it is better that the infant appear discontented when the bottle is withdrawn, than that he should relinquish it spontaneously.

After a primary delivery, the child, from insufficient prominence of the nipples, and the contracted state of the lactiferous ducts, often experiences great difficulty in obtaining milk; whilst the mother, on her part, frequently suffers considerable distress from the sensitive condition of the papillæ. The parent despairs of being able to nurse, she desponds, and perhaps relinquishes the duty; the breasts become tense and painful; smart symptomatic fever ensues; and mammary abscesses sometimes follow. By perseverance and resolution, however, the patient will accomplish her task, unless indeed she be predetermined not to nurse. The infant may be induced to embrace the papilla, by previously imbuing it with cream rendered palatable with sugar; by repeatedly, each day, applying an older child, that the nipple may be elongated, and the milk ducts more dilated; and where the organs are tender, by the occasional use of the artificial teat formerly recommended.

For a certain period of infancy, at least, no nourishment can be so proper as the milk of the parent, since children artificially reared rarely thrive well; and since, when the breast is abruptly withdrawn, emaciation *for a time* commonly follows. For the first nine or ten months, at least, not more than one in two hundred infants requires for the first two months, or longer, anything more than maternal milk; but as his days increase his organs become more active, his cravings more urgent in proportion; and sooner or later the breasts prove insufficient. In the second or third

month, however, artificial nourishment should be given, lest from sudden illness of the nurse, the child be exposed to the risk of premature weaning. Where the child forms a capricious dislike to either of the breasts, as sometimes happens, he ought invariably, when hungry, to be applied to it rather than his favourite. If this be neglected, and the infant be indulged in his whim, abscesses from accumulation form, and the function of the breast is destroyed.

A variety of aliment is used for artificial nourishment, as loaf bread, biscuit, or rusk. The bread should be previously infused in warm water, to rid it of the Sulphate of Alum, added by the baker to render it white. For delicate children, arrow root, sago, or groats, is often used. Of all these, until the infant is several months old, bread prepared as now directed may be considered the best; it should be made into pap with equal parts of milk and water. In Scotland, after the fifth or sixth month, infants are generally allowed a little porridge and milk once daily, which, in most instances, answers well, and generally keeps the bowels free; but when there is a disposition to cutaneous eruptions, the bread pap should be preferred. A table-spoonful daily is sufficient to commence with; and increased gradually according to the infant's wants. Animal food must be prohibited, until after the evolution of all the deciduous teeth, when an occasional indulgence only is to be granted. A little veal or chicken, or soup made from either, may be allowed. Rice pudding, with a small proportion of egg, is both a simple and nutritious article of diet.

Regularity in the time of giving the breast or food, should be particularly observed, both to prevent the nurse being exhausted, and the stomach and bowels of the child overloaded. No practice is more injurious than that of giving the infant either food or drink when he cries. During the first ten or fourteen days, he requires the breast frequently, for in consequence of his delicacy, he can suck but little at a time. After this period, however, it is sufficient to apply him to the breast once in three hours, during the day, and twice in the course of the night. When artificial nourishment is begun, the child must have the breast less frequently. If it has been found necessary to rear the infant artificially from the first, he must be allowed aliment often, but in small quantity at a time; while, upon being weaned, he ought not to have it oftener than four times daily.

Qualifications, Occupation, and Diet of a Nurse.—Every woman should be advised to nurse when practicable, were it merely to prevent frequent impregnation, which of itself en-

feebles the constitution, and undermines the system. Occasionally, however, it is the duty of the practitioner to dissuade the mother from nursing, and then it becomes a question whether the infant should be artificially reared, or a wet nurse procured. When the circumstances of parents permit, there should be no hesitation in adopting the latter alternative. The conditions of the system, under which females must be dissuaded from this duty, are, great delicacy of constitution; a strong predisposition to strumous disorders; and a descent from maniacal and phthisical ancestors. In the case of a female who has been maniacal in one confinement, it would be most prudent, in that immediately succeeding at least, to relinquish the idea of nursing, since there is a strong tendency in the disease to return.

The practitioner has a highly important duty to perform, in selecting a woman for this office. The individual chosen should not be younger than twenty, nor older than thirty; for when too young, she may be giddy, inattentive, and not possessed of sufficient milk; while, if advanced in years, she is neither so capable of supporting the fatigues of nursing, nor is her milk sufficiently nutritive. The age of the milk should correspond to that of the infant to be placed under her care; but if it exceed this by two months, she ought not to be chosen. A married woman should always be preferred to an unmarried person; and one who has had several children, to an individual who has been confined for the first time. It may be presumed that a female who has a family is more worthy of confidence than the individual who, perhaps, has no one to care for; and that a person who is the mother of several children will possess more experience as a nurse, and a more copious supply of milk. A woman after her first child, generally menstruates between the fifth and seventh month, at which period it would be too early to wean the child.

The breast should be plump, moderately distended, and present a well formed nipple. The infant she is nursing, or those she has already reared, should be seen, that we may be enabled to judge of the quality of her milk. But as neither the appearance of the children, nor of the secretion, can be relied on, it is to be understood, that if the child does not thrive, her engagement is to cease. Sometimes the milk has a watery appearance, at other times it is rather viscid; but if the infant thrive, neither of these conditions need be regarded. The nurse must neither be of a very spare, nor of a full habit. She should possess a large share of patience and good nature; be cheerful and affable in her conduct, and of

an obliging disposition; both that she may be able to amuse the infant, and that he may not, while under her care, receive impressions which might prove injurious at a future period. In choosing a nurse, we must particularly avoid such as from their general appearance, or lineal descent, are disposed to alienation of mind, strumous disorders, or pthisis. Individuals who have an impediment in their speech, or who squint, should be avoided; since the infant, when old enough to notice these defects, is apt to imitate them. Red and dark-haired females have been objected to, but it is difficult to conceive upon what grounds. When a nurse menstruates, her occupation must cease, and a substitute should be procured. This circumstance is sometimes carefully concealed by the individual, lest she be dismissed. Finally, the woman should be informed, that sexual intercourse with her husband must cease during her employment.

A hired nurse, were it merely for the preservation of health, must have some occupation independently of the mere duty of nursing; for when she is selected from among the humbler ranks, who are accustomed to corporeal exertion, the transition from an active to a sedentary life is so great and sudden, were she merely required to attend to the wants of the infant, that a state of the system would soon succeed, very unfavourable, not only for the nurse herself, but also for the child. When she is permitted to be idle, corpulency is sooner or later the result; the milk is diminished in quantity, and the child ceases to thrive, and becomes flabby. It is often difficult, however, to convince parents of the injurious effects of indolence and repletion on the part of the nurse, as they naturally suppose, that by kindly treating her, they improve the condition of the child. Independently, therefore, of the mere duty of nourishing and dressing the infant, the nurse, when not engaged with his concerns, should at all times be employed in some light domestic occupation. She ought in her avocations, to adopt such a methodical system of arrangement, as will enable her to act a conscientious part towards her charge, and economise her own powers. It would be unreasonable to expect, from most females at least, to have the infant perpetually in their arms. To save the powers of the nurse, and to obviate sensibility in children, they should be taught regular hours of rest as early as possible. For the first few months, they sleep the greater part of their time, which should always be encouraged. To induce infants to take rest, many families use cradles, which, when the parent undertakes to nurse, are necessary to relieve her from the fatigues of this duty: when

they are employed under the immediate eye of the parent, no injury is likely to be produced; but in the case of a hired nurse they are unsafe, lest when employed the infant might be so imprudently shaken, as to prove injurious.

During warm weather, he should rather be placed in a crib by himself, since by sleeping with his nurse, he might be overheated; or if he became fretful or restless, be unnecessarily indulged with the breast; or be overlaid, if she went to bed inebriated. Another important duty which devolves on the nurse is, to carry the infant abroad in fine weather. Exercise in the open air is a great means of preserving her own health, invigorating the frame of the child, and producing an earlier development, both of his corporeal and mental powers. An infant born in summer may safely be sent out a few days after birth. The walks may be more numerous and prolonged, according to the mildness of the weather. At this season, the greater part of the day, when the child is not asleep, should be spent in the open air. In the winter, however, if the infant reside in a spacious dwelling, it is unnecessary to send him out, until he is several months old, when one short excursion daily for several weeks may be deemed sufficient. As in winter and spring the cold is frequently intense, and the weather changeable, children should be warmly clothed, to secure them against the risk of inflammation of the chest and bowels, to which many of them annually fall victims. The latter is well known among the vulgar, under the term bowel-hives.

When accommodation can be procured, a spacious and well-ventilated apartment should be selected for the nursery. It should command a southern exposure, and the higher from the street, the purer will be the air. All unnecessary articles of furniture should be banished from this room; and in summer, the fire and carpet. As indolence is too often a besetting sin of nurses, and female domestics, the mother ought to make it a point of duty to see that the nursery is kept pure by frequent ablutions with water; by insisting on the windows being kept open, when the children are not asleep, nor the weather cold or damp; and by having the contents of the *pot de chambre*, with all other refuse, discharged as early as possible.

The diet of a nurse is a point not undeserving attention, since its regulation is highly necessary, though not among the least of our difficulties in female practice. Every mother, whether she becomes nurse herself, or is indulged with a substitute, is so desirous that her infant should become plump and beautiful, that no art is left untried to attain this cher-

ished object; wherefore, with this view, the nurse is too frequently pampered with a profusion of cordials, and rich food; hence corpulency and dyspepsia; and hence, also, impaired and diminished secretion of milk.

When a woman is employed from among the humbler orders, her diet ought not to be abruptly changed; it should be simple, but adequate to her wants. Nourishment, consisting chiefly of vegetables, is more productive of milk, and more conducive to health, than animal food. Soups are proper; but flesh of any kind should be permitted every alternate day only; and then it should be granted rather as an indulgence, than a necessary article. The same rule should be observed in regard to cordials, which, except when the nurse is fatigued, or deprived of rest by the infant, ought not to be permitted. When allowable, white wine or porter, are the most eligible. It can scarcely be credited, that there are practitioners who insist on their patients indulging largely in porter, negus, and punch, to support them under the fatigues of nursing; and if this be the fact, as I can aver, why should we wonder that scrofula, phthisis, and mania, should be such growing evils in society. If we compare with the children of the affluent, those of the peasantry, who are reared under few advantages, except those of pure air and exercise, and that they derive their support from mothers not vitiated by the luxuries of high life, the contrast will be too obvious to escape attention.

Weaning.—This is the last duty that devolves on the nurse. The age at which the breast is to be withdrawn, must depend on the season of the year, the vigour of the child, and the capability of the parent to support the fatigues of nursing. Weaning must at all times be conducted with care, for nothing can be more prejudicial to an infant, than to be abruptly deprived of that nourishment, which, from his birth, has constituted his chief support. When children are reared as directed, they may be weaned at the proper time with little trouble; but when this plan has not been followed, the process is attended with difficulty to the nurse, and occasionally with danger to the child, who is certain, for a short time, of becoming more or less emaciated in consequence. A separation of the child from its mother ought not, if possible, to be made during the winter months; not only because privations are then more severely felt, but because the infant cannot often be carried out, owing to rigorous weather. During weaning, it is necessary he should be carried abroad, that, by the variety of surrounding objects, he may be amused, diverted from the recollection of the breast, and be kept from

fretting. Nursing, therefore, should, if possible, be continued until mild weather is ushered in. From nine to twelve months is the time usually allotted for nursing in this country; and from ample observation, I am satisfied that the shorter of these periods is sufficient for a healthy child; while the longer will be adequate to one who is weakly. Many causes may intervene to prevent the nurse suckling the child for the proper period. The milk may, in a few months, as frequently happens after first labours, be so much diminished, as to be inadequate to his wants; the monthly indispositions may return too early; or the nurse may conceive before the conclusion of either of the periods stated. The infant, however, under all these conditions, is occasionally seen to thrive. When the milk disagrees with him, there should be no hesitation in weaning him; and the same plan should be followed when the nurse is seized with any severe local or general disease, that every cause of irritation may be removed. The welfare of the child does not, however, always call for such a step; for children have been known to thrive while suckled by females affected with fever, inflammation, or even profuse expectoration from phthisis.

When it is wished to wean the child, his access to the breast during the day must be at longer intervals, until it be entirely suspended; which, by making frequent excursions in the open air, and giving a little artificial nourishment oftener than usual, may be accomplished in a week. To divert his attention from the breast, the aliment must be given by the spoon in preference to the nursery-bottle. As he is most unmanageable at night, some mild drink should be in readiness to supply the want of the breast, as weak tea, thin gruel, whey, or milk and water; or, if he be delicate, chicken, veal, or beaf tea may be allowed. To give the child a dislike to the breast, covering the nipple with an artificial teat, or a double fold of calico or linen, previously immersed in an infusion of Quassia, will be both harmless and effectual. When the nurse ceases to suckle the infant, her breasts are apt to become distended, and to suppurate, which, by early attention, may be prevented, by the use of purgatives every alternate day, fomentations of acetous acid, frictions on the organs with Ol. Ammon, and abstemiousness in fluids and solid food.

CHAPTER II.

ACCIDENTS AT BIRTH.

Suspended Animation.—Though occasionally the fœtus is heard to moan or cry while in the vagina, or in the uterus even, yet, generally speaking, respiration does not begin until the head is born. This important function, however, may be impeded by a variety of causes, as natural feebleness of the infant, protracted retention in the passages; long continued pressure upon the head, from a contracted pelvis or forceps; and interrupted circulation in the funis, from its descent during labour. Of these causes, pressure on the funis is by far the most dangerous; for cases frequently occur, where the head is much compressed for many hours without any material injury to the fœtus; but where, had the cord been similarly situated merely for a few minutes, death would be certain.

When, in *the first place*, the infant does not breathe, and the funis is flaccid, of a green, yellow, or livid colour, without pulsation, all attempts at resuscitation are useless.

In *a second case*, there may be complete syncope, slow, feeble circulation, and absence of respiration, in which the efforts of the practitioner are generally successful; and if the heart's action become stronger and more frequent, the case may be considered favourable. The mouth and nostrils should be cleared of mucus, which they sometimes contain, and may to a certain extent impede respiration; after which we inflate the lungs through the *nares*, while the mouth must be closed. Breathing through the nostrils, until the chest be moderately inflated, is a more effectual method of restoring animation, than by the ordinary resuscitating apparatus. The air is to be expelled by gently pressing on the thorax, and this operation persevered in until there are no longer any prospects of success, or until our object has been attained. So important a duty must in no instance be hastily relinquished, since, by judicious measures perseveringly applied, animation has often been restored in hopeless cases. While we are attempting to reanimate the prostrate energies of the heart and organs of respiration, we must also endeavour to excite the nervous system. With this view Aq. Carb. Ammon. should be applied to the temples, upper lip, around the neck, and spinal column; but when this drug cannot be procured, spirits of any kind may be used.

In a *third case*, owing to pelvic pressure, the head and features may be distorted, countenance swollen and livid, and respiration much oppressed, without the pulsation in the cord being affected. Here the interrupted respiration may be ascribed to pressure on the encephalon, from its vessels being congested. The object in this case is to abstract blood from the system as early as possible by dividing the funis; and in a stout child, permitting it to bleed freely, or in a weakly subject moderately, and to continue or suspend the effusion, as a due observation on its effects shall point out. Respiration may be impeded by the funis being firmly entwined round the neck, and if it cannot be expeditiously disengaged, it must be divided, but an attempt must previously be made to inflate the lungs. Sometimes animation is suspended from the shoulders being wedged in the outlet, and accompanied by a protrusion of the funis. The cord, if it encircle the neck, must be slackened, and the lungs inflated through the nostrils, that the aerial life may be established before the uterine has been suspended.

External warmth is another agent which is most conducive to recovery: the proper method of applying it is suddenly to plunge a considerable part of the child in water sufficiently warm to stimulate; and instead of protracted immersion, which, according to the investigations of Dr Edwards, would be injurious, after a few minutes to withdraw him in the event of there being no evidence of returning animation, or to do so immediately on the commencement of respiration; and thereafter continue the stimulating frictions. In the case of a vigorous infant again, the stimulating effects of heat and cold may be simultaneously conjoined, by sprinkling cold water on the face and chest, while the legs are immersed in warm water. Some cordial should be administered, as white wine negus, or brandy and warm water; which, when the child has lost the power of swallowing, can be introduced into the stomach by a gum tube.

Management of the Funis.—After being secured by a ligature, and divided, it is drawn through an aperture in the centre of a square double portion of cotton or linen cloth, in which it is to be enveloped. This covering is suffered to remain until the cord separate, which is accomplished by ulceration, and happens generally from the fourth to the sixth day. Daily after ablution, a clean piece is introduced betwixt that which contains the cord and the skin, to prevent the latter being irritated by the morbid discharge or the indurated cloth in which the navel string is enveloped. During the ablution of the infant, the ulcerated umbilicus

should be bathed with tepid water, then sprinkled with some absorbent earth, as the Carb. Zinc. Impur., thereafter covered with a piece of cotton or linen cloth; and lastly, the whole protected by the *belly-band*. When these steps have been disregarded, I have repeatedly known ulceration of the umbilicus supervene and prove fatal. In these circumstances, first one or two leeches, and thereafter a flour, or fermenting poultice, must be applied and frequently changed; after which simple dressings are to be used. Every attention must be paid to cleanliness; and the nurse, during the indisposition of the patient, should study to keep him on his back while at rest, that additional irritation may be avoided, and the sore encouraged to heal.

Post-mortem examinations of several infants in my own practice, displayed inflammation of the umbilical vein. The morbid phenomena connected with these cases during life, were torpor of the bowels, yellowness of the surface, perpetual moaning, aud ultimately convulsive fits. Pus was discovered in that portion of the vein which is within the abdominal parietes. When such a state is detected, leeches and warm fomentations upon the umbilicus and region of the liver, with the occasional exhibition of Castor Oil or Magnesia, should be directed. Ulceration at this point is sometimes attended with bleeding from one of the umbilical arteries. When compression, the application of Pulv. Alum. Comp., or of Nitras. Argent., will not arrest the effusion, the vessels must be secured by ligature.

Contusion and Swelling of the Scalp.—When the head, in consequence of its size, narrowness of the pelvis, or the unyielding condition of the external parts during labour, is long retained in the passages, it is elongated, and its integuments tumefied at different points. A similar state results where the retention of the cranium has been protracted in consequence of malposition. The long-continued application of forceps may not only cause elongation of the head, but tumefaction, and even laceration of its teguments. These swellings may arise either from sanguineous, or more frequently, serous effusion, in consequence of rupture of the finer order of blood-vessels. Our opinion as to their mode of termination may generally be favourable, for they are rarely followed by unpleasant consequences. In one instance where forceps were misapplied, exfoliation of the occipital and frontal bones followed, but even here the patient speedily recovered.

Lacerations of the integuments, however trivial, after having been bathed with tepid water, should be carefully dress-

ed with simple ointment, morning and evening. The swelling of the parts is effectually discussed by the continued application of one part of brandy, or any other spirit, and two of water. Sanguineous effusions, however, do not subside so rapidly as the serous, and tumours thus arising should be punctured to favour the escape of their contents. When the head is elongated, the attendants often endeavour, by pressure, to restore its natural shape; but this practice should always be discouraged, not only as hurtful, but unnecessary, since, after a little time, it will resume its natural form without any mechanical interference.

Fractures and Luxation of the Humerus, Clavicle, Inferior Maxilla, and Femur.—In these accidents, the bones and joints particularized, may occasionally be involved at birth. Fracture of the clavicle is discovered by an unusual prominence near the scapular extremity of the bone, while it is observed that the sufferer never attempts to move the corresponding arm, or if it be done for him, that he moans or cries. Injuries of this nature never occur except in preternatural labours, and are to be ascribed to incautious efforts in disengaging the arms or the head. I have never witnessed luxation of the clavicle, or of the lower jaw. The latter is ascertained by distortion of the countenance, unusual openness of the mouth, and inability to suck. It is produced during the extraction of the head, by exerting too much force on the jaw. The injury should be rectified as early as possible, to prevent the child suffering.

Fracture and luxation of the humerus and femur may exist for some time unknown to the attendants, who ultimately detect these accidents by observing that the limbs are swollen, that the child not only never attempts to perform any motion with them, but frets exceedingly when it is done for him. They occur either in cases of protrusion of the upper, or presentation of the lower extremities, from incautious interference, or ignorance of the manœuvre by which such labours should be managed.

In children, these injuries are more easily treated than in subjects farther advanced in life; and they ought to be properly attended to as early as possible, to prevent convulsions being induced from general irritation, or permanent lameness and deformity. It may be proper to conceal these accidents from the parent, to prevent her mind being agitated, but the attendants should invariably be acquainted with them, if it were merely to assist us in the treatment.

CHAPTER III.

ABNORMAL FORMATIONS AND CONNATE DISEASES.

Occlusion of the Anus.—These defects are rather of frequent occurrence, and present considerable variety. The anus may be rendered impervious by a membranous reflection, superficially seated; or so great a degree of contraction of the extremity of the rectum may exist, as to obstruct the transit of every thing except liquid matters. These constitute the slighter degrees of obstruction. Sometimes the obliteration of the canal, instead of being superficial, is deep-seated; occasionally, the intestine terminates in a *cul-de-sac;* and in some instances, it communicates with the vagina in the female, or with the vesica urinaria in either sex. The prospect of affording permanent relief, in all cases of this description, is diminished or increased, according to the distance or proximity of the obstruction to the external surface. The presence of the defect is easily ascertained, in most instances; for, occasionally, there is not even a depression, much less an aperture, to show where the anus should have been situated. In other cases, the termination of the gut is pervious; but the obstruction is placed so high in the pelvis, that its existence at first, is not even suspected. When, at the lapse of from six to twelve hours after birth, the infant has not voided meconium, while he occasionally moans or screams, is affected with turgidity of the eyes and face, and strains, some obstruction in the bowels may be suspected, and the canal should be explored. A bougie, enveloped in a piece of muslin, should be advanced into the gut; and if it appear soiled on being withdrawn, we know that the canal is pervious; and *vice versa.* On inspecting the situation of the anus, if the obstruction be superficial, and caused merely by a thin membrane, some degree of tumefaction, of a dark hue, induced by the accumulated meconium, will be observed.

As such obstructions must soon prove fatal, when their presence has been ascertained relief must be attempted. When the termination of the intestine is simply contracted, it may often be observed that the infant screams suddenly, and draws the limbs upon the abdomen; and that a few drops of blood are passed with the meconium. In this case, the passage must be gradually dilated by a large bougie, or a small wax candle. When the rectum is rendered impervious by a membrane, the obstruction must either be perforated or incised;

and thereafter, an oiled lint tent, gradually increased in thickness, introduced until all tenderness subside. Where no anus can be detected, time ought to be allowed for the meconium to gravitate, before an operation is resorted to, as in the interim, some phenomenon may probably show itself, which may guide us to the rectum.

When the lower part of the passage is pervious, and the obstruction distantly situated, a bistoury is to be conducted towards it upon the finger, and its division from behind forward accomplished. If the stricture be so high that it cannot be attained by the finger, a long slightly curved canula is to be carried up until it meet with resistance, when the trocar is to be introduced within the latter, and cautiously pushed through the stricture. The escape of meconium will show that the gut has been perforated; the instrument is then to be withdrawn, and a capacious gum tube substituted, until every chance of the parts reuniting has ceased. In cases where there is no appearance of an anus, two modes of relief are proposed, *first*, to perforate the rectum by a large trocar and canula pushed through the perinæum, a little anterior to the coccyx; and, *secondly*, to form an artificial anus in the left iliac region, by a perforation in the colon. Should the former method be adopted, pressure, during the operation, must be made on the abdomen, to prevent the intestine receding before the point of the instrument. If meconium escape, the after treatment must be the same as in the foregoing case. The second plan was suggested by Littre; and Gardien relates two examples where it was successful. Although these latter expedients must be extremely hazardous and uncertain, and an individual when thus preserved, perhaps rendered for ever loathsome, owing to the involuntary escape of the fæces, yet the adoption of such operations may be imperative, if the preservation of life be desirable, as in a case where titles and fortune would otherwise be lost to a family.

In a healthy well developed child about three months old, in whom the rectum terminated in the upper and back part of the vagina by an opening the third of an inch in diameter, Dieffenbach passed a curved director into the rectum per vaginam, and pressed it downwards; a sharp pointed bistoury was then introduced immediately behind the *fossa navicularis*, and advanced towards the director without cutting into it. The incision was extended near to the os coccygis, thus dividing the whole of the perinæum; and when the edges of the wound were separated, the extremity of the rectum could be seen terminating in a *cul de sac*. The lower part of the

gut was then carefully detached with the bistoury from the posterior surface of the vagina, still open, and left in contact with the first made wound. The opening of the rectum into the vagina, after having been once touched with Argent. Nitras., was perfectly closed. In fourteen days, the edges of the wound cicatrized; and in three weeks from the first, a second operation was performed for the purpose of constructing a new perinæum, by further separating the anterior surface of the rectum from the vagina, and the sides of the extremity of the rectum being already adherent to the sides of the former incision; when the anterior part of the gut was separated, it was drawn backwards four or five times by the already adhering parts. The edges of the fore part of the old opening were now cut off, so that they might unite by the adhesive process when brought into contact. The deeper seated parts were drawn together by a suture, the ends of which were cut off quite close, and the integuments by two small pins, over which the twisted suture was applied; and thus were the parts secured, and a new perinæum formed. On the fifth day the sutures and needles were removed, union having taken place; and the operation was quite successful without any subsequent interference, than the daily introduction of a small bougie into the rectum.

When the rectum communicates with the vesica urinaria, this is known by the secretion being tinctured with meconium. These defects, though apparently perplexing, would seem nevertheless to be the most easily rectified. In two cases of this description which I have witnessed, both were successfully relieved by operation. The first was a stout male infant, born of healthy parents, in a primary labour, on the 3d of March 1831. In this case my friend Mr Fergusson, now Professor in the Chair of Surgery, King's College, London, attempted, by cutting towards the sacrum, to reach the rectum, when it was deemed advisable to delay further proceedings until the following morning, in expectation that the meconium might gravitate, and guide the operator to the intestine. In this, however, we were disappointed; and Mr Fergusson, after passing a grooved director into the bladder, which was pressed against the perinæum, perforated this viscus where the point of the instrument was felt, when a profusion of meconium was discharged. Four different times shortly after the operation, the artificial anus required to be slightly enlarged by the knife. The child continued to thrive, was vigorous, and possessed full control over the rectum. What was singular, except once or twice, and

then a few drops only, he never voided urine by the perinæum; nor had he, from a short period after the operation, passed fæces but four times by the urethra.

In the second case which I had an opportunity of witnessing, the defect was of the same nature and similarly rectified with the foregoing. The child was a healthy male, born on the 5th September 1832, and was operated on forty-eight hours afterwards. It continued to thrive until the 15th January 1833, when it was cut off by bronchitis. For a considerable period before he died, none of the urine passed by the rectum, nor of the fæces by the urethra; while he seemed to have acquired almost perfect control over the intestine. *Dissection* proved that the incision during the operation had been made in the rectum, which opened into the membranous portion of the urethra by an aperture the diameter of a goose-quill. In performing such an operation, I would suggest that the bladder be previously distended with tepid water, that its situation, after incising the perinæum, may be more easily ascertained; while to force the organ into the pelvis, pressure should be applied to the abdomen during the incision.

Occlusion of the Urethra in the Male, and of the Urethra and Vagina in the Female.—Imperforation of the vagina may be partial or complete, but these conditions are seldom known to exist, until the functions in which this canal is concerned commence. All interference until the age of puberty, is uncalled for; and the practice which must then be pursued, will readily suggest itself to a judicious practitioner.

Imperforate urethra, whether in the male or female, requires to be speedily remedied, lest it prove quickly fatal. When there has been no discharge from the bladder, at the lapse of from six to twelve hours after birth, and if the infant appears uneasy, the canal must be examined. At the same time it should be remembered, that male children frequently do not void urine for thirty or forty hours after birth; while female infants again, perform this function, generally, in a few hours.

In either sex, the obstruction generally arises from a thin membrane being reflected over the extremity of the canal, from its being filled up by some glutinous or chalky deposition, or from the passage being imperforate. In the first case, we must perforate the obstruction, and afterwards prevent cohesion; and in the second, a little warm oil or warm water is to be cautiously forced into the urethra, to facilitate the removal of the deposit; and in the third, circumcision must be performed.

Tongue-tied.—The frænum is sometimes unusually short,

or it extends too far upon the apex of the tongue, whereby this organ is much limited in its action. The infant cannot suck properly; and if this defect be neglected until he begins to speak, this important function is also impaired. As we are often importuned by parents to remedy this defect when it does not exist, and as young practitioners may be imposed upon, its nature should be known. When present, and requiring to be remedied, the child is never remarked to push the organ beyond the lips; the apex is almost continually curled upon its under surface; if its point be raised, the frænum is observed to be stretched; or to extend farther forward than usual, sometimes to the very point of the tongue.

Relief is obtained by the infant's face being turned towards the light, the index and middle fingers introduced under the tongue, which must be pressed against the roof of the mouth, and the frænum divided by a blunt-pointed pair of scissors. The instrument must not be carried too near the radix of the organ, lest a blood-vessel might be wounded. In the event of such an accident occurring, the hæmorrhage must be suppressed by touching the vessel with the Nitras. Argent. or the actual cautery.

Hernia Umbilicalis.—Owing to preternatural dilatation at the umbilicus, a protrusion of the intestines into the sheath of the funis, is sometimes observed at birth. In weakly children, and in those who are allowed to fret perpetually, this kind of hernia, although not present at birth, appears at some subsequent period. Before the circulation between the parent and child be interrupted, the protruded viscera should be returned into their proper cavity, lest by their inclusion in the ligature applied on the funis, the child might be destroyed. The viscera must be retained in the cavity of the abdomen by the application on the umbilicus of a circular portion of sheet lead, inclosed in several folds of cotton cloth, and secured by a bandage. As the young patient acquires vigour, this opening gradually contracts, and in two or three years the protrusion disappears.

Hernia Congenitalis.—This affection may be connate, or in consequence of relaxation and frequent crying, appear soon after birth. It is a protrusion of some abdominal viscus into the *tunica vaginalis* testis, from the canal through which the latter passes continuing open. The complaint cannot be mistaken in children, for in them we rarely meet with any other kind of hernia at this point. The affected side of the scrotum will be distinctly seen enlarging when the child cries, coughs, or strains. If the testes have descended, the protrusion is to be replaced, and retained *in situ* by the im-

mediate application of a suspensory bandage. The bowels are to be kept free, the scrotum bathed twice daily with cold water, and the use of a truss abstained from for the first eighteen months.

Hypospadias.—When the urethra, instead of terminating at the extremity of the penis in the centre of the glans, opens at any other point of the organ, this is the term which such a malformation has been styled. The urinary passage may open in the immediate vicinity of the scrotum, on the under surface of the penis, at some intermediate point between the scrotum and the glans, or at the very base of the latter. Sometimes there is no appearance of a penis, and the scrotum is cleft into halves,—the urethra terminating in the centre of the fissure.

From the general concurrence of practitioners, there is but one variety of this malformation that either requires or admits of a remedy. This is, where there is a preternatural aperture, though the penis be pervious almost to its very extremity, but where the urethra at this point is obstructed by a thin membrane, which should be punctured. When this canal terminates at the radix of the penis, or in a fissure in the scrotum, the procreative function is lost, and there is no remedy; but when the canal opens nearer the extremity of the membrum virile, there is abundant evidence before the profession that the individual can procreate, and that the defect does not require any interference.

Hare-lip.—This is the most frequent congenite deformity. It consists in a cleft of the upper or under lip, more frequently the former, but sometimes both are affected; or we find in some rare instances, a double breach in the upper labium alone. When the malformation is limited to either lip, it may be considered simple, and easily remedied; but we occasionally meet with cases where the fissure is not confined to the labium, but extends also into the jaw, forming a large chasm in the roof of the mouth, proceeding along the bones of the palate, even as far as the uvula. Sometimes the bones of the palate are wanting, which defect gives the mouth a most unpleasant appearance.

These imperfections are to be remedied by bringing the edges of the fissure, previously intenerated, into apposition, and retaining them in contact by the *proper pins*, until the parts cohere. The pins should include a considerable portion of the integuments, to prevent their premature disengagement by ulceration. The mode of closing up the internal chasm will be understood from what is to be stated in the next subject. A most important question to be decided

here is, the period at which it would be proper to perform an operation. Owing to the great susceptibility of the nervous system, children are exceedingly liable to convulsions from any severe irritation; wherefore, operations, unless when the cause for which they are required is likely to involve the life of the patient, ought not to be performed until he has been weaned; since, after this period, he may be nourished without any great exertion of the lips. But if the malformation be so great that the child cannot embrace the nipple, the defect may be rectified at any period after the evolution of all the deciduous teeth.

Separation of the Uvula and Palate.—When the parts are thus constituted, the infant cannot suck, as no vacuum can be formed in the mouth, in consequence of the air rushing into it through the nostrils; and when the patient begins to speak, articulation is very indistinct, and accompanied with a disagreeable nasal sound. Here no operation should be attempted, until the individual is aware of the necessity of having something done to improve the condition of the voice. The margins of the fissure are to be intenerated by the Nitrate of Silver, and afterwards brought into apposition by a few stitches, and during treatment the patient should be restricted to liquid nourishment.

Club Foot.—Sometimes only one foot, at other times both, are distorted. The left is more frequently affected than the right; and it is oftener turned inwards than outwards,—the former condition being termed *varus*, the latter, *valgus*. Independently of these varieties, the foot is sometimes drawn upwards upon the front of the leg; and in other cases, the toes are drawn backwards towards the heel. Some of these deformities are contracted after birth. Delpech ascribes these malformations to contraction or shortening of some of the muscles of the limb, in consequence of original defect in the nerves distributed to them, an opinion satisfactorily supported by the fact of these defects being frequently and speedily rectified by the knife. Malposition of the bones of the tarsus, though at one time considered as a cause, must be viewed rather as the effect of the muscular derangement.

Most of these can be materially, if not completely remedied; but congenite deformities, and especially those accompanied by lesion of the intellect, or of some of its faculties, are much less easily managed than such as have been contracted subsequent to birth. In undertaking the remedial process, a large share of patience is required, and the interested party should be made aware of this; for there is nothing which has more frequently frustrated the best directed

efforts, than impatience. The treatment must be conducted in accordance with the explanation offered of the causes. By means of mechanical inventions, in the form of boots or shoes, which will readily suggest themselves to mechanics and surgeons of ingenuity, the affected muscles are to be *gradually* extended, and the foot constantly retained in as natural a position as possible, *without injurious pressure*, while the action of the antagonizing muscles is to be frequently exerted. These measures ought to be commenced in early infancy. When, after repeated examinations by several practitioners, the division of tendons or muscles is recommended, such operations, for reasons stated in speaking of hare-lip, should be abstained from until after the evolution of all the deciduous teeth. Of late years, the tendo Achillis has been divided with advantage.

Supernumerary Parts.—Those which are most commonly remarked at birth, are an extra thumb or little finger, growing from the side of the natural ones; and in the foot, an extra large toe, or a small one, similarly developed. Sometimes tumours of considerable magnitude grow from different parts of the body. So long as the preternatural part does not interfere with any function, no operation should be performed in early infancy. Supernumerary fingers and toes are, generally speaking, but superficially connected with the rest, and may at any time be clipped off with scissors.

Chronic Hydrocephalus.—The chronic state is the form under which the congenite species presents itself; and the morbid action which leads to it may either be primary or consecutive. The water may be situated between the dura mater and tunica arachnoidea, and between the pia mater and the brain; and not unfrequently in the ventricles of the latter. Though the situation of the effusion has been so confidently laid down in books, yet the most careful dissection will not, in some instances, determine this point. How often are the membranes, and even the brain itself, lacerated in raising the bones; and how often is the texture of this organ so completely destroyed by the volume of water, that all distinction into cavities is entirely lost? This affection is peculiar to children, who are occasionally born with it; or who may be affected at various periods after birth: there are but few instances recorded of its having occurred in adults. Hildanus mentions one case. When hydrocephalus is connate, the cranium is generally too large to pass through the pelvis without the diminution of its volume, which prevents our forming a just estimate of the amount of the effusion. I have known the cranium contain from two to five pints of

water. Such cases are by no means rare. It may commence after, as well as before birth. One infant in my practice was seized with it six weeks, and a second five months, after birth. When it manifests itself after birth, the accumulation of water, and consequent enlargement of the cranium are sometimes incredible. One of my patients, who has now laboured under the malady for upwards of sixteen years, has a head about one half larger than any adult; the cranium of Cardinal, described in the 2d vol. of the Lancet, measured in circumference thirty-three and a half inches, from ear to ear twenty and a half inches, and from the vertex to the root of the nose twenty-one and a half inches. Large as this skull might appear, it was trifling compared to two spoken of by Hewson; the one contained fifteen, and the other twenty-five pints of fluid.

The morbid appearances are, a deficiency, and even change in the substance of the brain and bones of the cranium. The brain may be white, soft, pulpy like coagulated lymph, and sometimes greatly reduced in volume, as if absorbed. The cerebellum, however, may be sound even where the disease has existed many months. The bones exhibit a great deficiency of ossific matter; to a considerable extent they are in fact membranous, while at different points they appear as if the trephine had been applied on them. In some instances, the bones of the cranium, more especially the parietal and occipital, have been known to expand, and to become so much thicker in these cases, as to have given rise to the notion, where their history was unknown, that they appertained to some gigantic race. In the neck also, the vertebræ have appeared thicker and stronger, as if from an effort of nature to support the enormous mass.

Inquiries into *the causes* of this affection, when congenital, are generally unsatisfactory. A predisposition to it has been strikingly manifest in some families, by several of their children having fallen victims to it, at the same age, in succession. The following particulars of the parents of a male child, for whom the author was consulted in June 1842, are remarkable, and exactly in point: The young patient was two months old, and from the moment of birth was observed to be affected with spasms, always while on the eve of falling asleep. The father of this infant was 38, the mother 32 years of age, both healthy; but the female parent was of an anxious disposition. On the 28th Dec. 1841, when the mother was about six months pregnant with the subject of this case, another child belonging to the family suddenly died in convulsions. The male parent was married formerly,

and his last child by his first wife, from having congenite hydrocephalus, was extracted with the crotchet; while the fœtus which preceded it was *anencephalous*. Great corporeal delicacy is a condition which has been remarked in most children; and it has often been observed in those of a strumous diathesis. I have met with cases where there could scarcely be a doubt, that injurious compression of the head during labour led to the disease, and Cruveilhier and others entertain the same opinion.

The *exciting causes* are generally very obscure. On the part of the mother, violent mental emotions, undue indulgence in spirituous potations, and injuries, such as falls and blows on the abdomen during pregnancy, are spoken of as having led to the disease, and, in some instances, with apparent justice; for I have long suspected the influence of these causes. When chronic hydrocephalus appears after birth, in many patients the exciting causes may be easily determined, as great terror, fits of passion, irritation general or local, and none more frequently than that arising from dentition. The disease may often be ascribed to external injuries, such as may arise from falls, and blows on the head; and it has supervened to measles, scarlatina, pertussis, and to the use of powerful styptic applications, for the desiccation of discharges from the head. Occasionally it may be traced to irritation, produced by some morbid condition of the liver, mesenteric glands, or mucous tissue of the intestines. How often has diarrhœa of long standing led to this affection; and especially sudden suppression of the dejections? The application of cold to the lower extremities, either from deficiency of clothing, or neglecting to remove wet napkins from around the child, may lead to congestion of the brain or other cavities, with inflammation more or less acute, and consequent effusion; and this will explain not only the *modus operandi* of all the causes, but also the immediate nature of the disease itself, whether congenite or otherwise.

The symptoms are by no means uniform; frequently the disease commences by a slight convulsion, in which the face is observed to become a little purple, the whites of the eyes to be turned upwards, and the patient to yawn and stretch; in other instances during the fit, the eyes are little if at all distorted, their lids merely are moved with great velocity, which phenomenon is accompanied by sudden screaming. These appearances subside; the sufferer, with the exception of some degree of languor, which endures for two or three days, is apparently well; he soon regains his former cheerful-

ness, and continues in this promising condition for some time; when, probably, a second convulsion supervenes. In other cases, the first warning is a state of languor which increases as the evening approaches; the infant rarely smiles, he seems unable to support the head, and suffers it to fall carelessly on the shoulders of the nurse. To this state succeed an inanimate eye, puffiness and redness of its lids, occasional fits of peevishness, paroxysms of fever, flushing alternating with paleness of the countenance, a variable appetite,—sometimes a craving, at other times a total disinclination to food, with occasional attacks of vomiting, less frequently diarrhœa. When patients are able to state their own feelings, headache is sometimes but not always mentioned, and giddiness; or we are told that they are like to fall, from the head feeling so heavy. Sleep is much disturbed; sometimes the patient has two or three restless nights in succession, and the third or fourth is passed tolerably quiet. During sleep the eyes are partially closed; and the child frequently starts or screams. The circulating system participates in the general derangement. At the commencement, the pulse is frequent, seldom so slow as ninety-five; and throughout the whole disease it is irregular. Its frequency diminishes as the accumulation in the head increases; and in the latter stages, except when convulsions frequently recur, it is below the natural standard.

In the progress of the malady, muscular energy is impaired; for in a patient old enough and able to walk, he either relinquishes this function altogether, or, if he still persist, an unsteadiness may be observed in his step, he frequently staggers, the lower extremities feel cold, and pain in the knee-joints is complained of. Derangement of the digestive apparatus keeps pace with that of other organs; there is furred tongue, fœtid breath, constant thirst, a yesty appearance, or highly dark coloured state of the stools, which are occasionally intermixed with slime. The functions of the skin are disturbed; it feels dry, the hair is in a similar state, the whole surface appears sallow, and perspiration is readily excited by any exertion. As the complaint advances, the head presents some striking changes. It gradually enlarges by the opening of the sutures, and by the expansion of the bones, especially those which form its upper parts. A puffiness and tension of the integuments covering the anterior fontanelle when open, are observed, but this may arise from mere congestion unaccompanied by effusion. In the commencement, the head feels somewhat warmer than natural; but in a little time this almost wears off. Symptoms of compressed brain

daily become more obvious; and derangement of the intellectual faculties ensues. The forehead projects, while the remainder of the countenance sinks in as it were, and is not only slowly developed, but is never so expanded as in a healthy person of the same age. From the weight of the effusion upon the brain, the memory, vision, and speech, are impaired; and so is hearing, but not to the same extent as the other faculties. From an early period, there is strabismus; and when the disease is far advanced, there are dilated pupils; and vision, in many cases, is lost. In the advanced stages, speech is indistinct; and the patient requires time to express himself. The memory is almost entirely gone. Some of the animal functions do not suffer anything; the appetite, for example, continues in many instances unimpaired. Michaelis, in his Medical Commentaries, relates the case of an individual who was hydrocephalic from birth; he lived to the age of twenty-nine; had a good memory; enjoyed an excellent appetite; and his eyes were natural. Cardinal, already alluded to, retained possession of most of his faculties till death, which happened in his twenty-ninth year. Hildanus relates the case of a boy three years old, who was seized with the disease, and lived to the age of eighteen; though the size of his head was enormous, yet he spoke distinctly; his articulation, however, was far superior to his mind, and he suffered greatly from epileptic fits. A patient already alluded to, whom the author occasionally visits, is in his twenty-second year, and has had the disease since the age of five. His appetite is good, but his memory, vision, and articulation are lost; he has no control over the rectum or bladder; and he occasionally suffers from epileptic fits, but in other respects his health is favourable.

The duration of the disease is very uncertain. When it appears in early infancy, all the symptoms are aggravated by the irritation of dentition, and the patient may be suddenly cut off by convulsions; but if it show itself after the evolution of the deciduous teeth, or if the sufferer have been affected even previously to the commencement of dental irritation, but have passed through it, he may drag on a miserable existence for a considerable period, as in the cases already related. At length, all the senses are obtunded, and at last annihilated, and the patient dies epileptic, or more frequently during convulsions, which, in the latter days of the disease, are often present.

In the diagnosis, it ought ever to be remembered, that this is a most insidious affection; and hence it happens, that it has often been found in an advanced stage, when its presence

was scarcely suspected. Its great resemblance to affections of minor importance, such as fever, irritation arising from teething, from worms, and from derangement of the stomach and bowels, has too often obscured the complaint, and led to irremediable errors! The fever becoming mild or less obvious as the disease advances; the openness of the sutures; the size and rapid increase of the cranium, when compared to what happens in healthy subjects of the same age; the tension and elevation of the integuments over the anterior fontanelle; the derangement of the intellectual faculties; the impaired condition of the organs of sense, particularly that of the eye; and the reiterated occurrence of convulsions, besides other symptoms of minor consideration; are a concourse of phenomena so very obvious, and so highly characteristic of this affection, that a proper investigation can scarcely fail to make an early detection of it.

Of the prognosis little need be said, for every person must be aware of the formidable nature of the disease; but it is proper to state, that some desperate cases have been remedied. I had under my care, in 1829, a female child, to whom, when seven months old, I was called, in consequence of her having for some time occasionally suffered from convulsions; and although they seemed evidently connected with the irritation of teething, yet there was such a state of the cranium, as would have compelled the most sceptical to admit the presence of water. At birth she had a healthy appearance, and the sutures and bregma were not larger than usual. When she was about five months old, the first convulsion supervened, but my services were not put in requisition for two months afterwards, when I found the anterior fontanelle at least twice as large as it was at birth; and in the course of the sagittal suture, the finger could be insinuated between the edges of the parietal bones. The lambdoidal suture was also very open, though not to the same extent as the sagittal. This child was restored to perfect health, but a peculiar appearance of the eyes remained. After the recovery of Dr Vosse's case, where the accumulation of water was so profuse, that the head, when a light was held near it, was so transparent as to resemble a paper lantern, one scarcely ought to despair? When there is much stamina in the system, and the patient has passed in safety through the irritation of teething, the issue of the case is uncertain. A rapid increase of the cranium, the gradual abolition of the mental faculties and senses, and the frequent recurrence of convulsions or epileptic fits, with emaciation, are the assured precursors of fatal termination. The gradual diminution of

the head, while there are evidences of returning intellect, such as the individual recognising familiar objects and former acquaintances, with a less frequent recurrence of convulsions, may be viewed in a favourable light.

In the treatment of this affection, the object is to remove the water either by internal or external means, and to improve the general habit. The only class of medicines that has been at all sensibly useful in causing absorption of the water, is purgatives. These must be selected according to the age and vigour of the patient. The drastic are the best, but in young children their use is often inadmissible, at least to such extent as to prove beneficial. After the child has passed through the irritation of teething, however, drastic purgatives may be used with much greater freedom; and under judicious management, to a considerable extent. In diseases which, like the present, induce much torpor of the nervous system, the very strongest cathartics must be ordered, and that too in much larger doses than under ordinary circumstances. The preference must be given to Calomel and Scammony, except where there is much febrile irritation. To an infant a year old, two grains of the former and four of the latter combined, may be exhibited either in the morning or evening, to commence with; but the dose must always be regulated according to its effects. The bowels should be freely evacuated every second day, and lest the Submur. Hyd. produce too much irritation of the mucous tissues, its use must be alternated by that of Scammony alone, the simple or compound powder of jalap, the infusion of senna, or castor oil. None can be more eligible than the latter, under circumstances of febrile excitement. Calomel, in smaller doses than I have stated, such as half a grain morning and evening to young infants, has been recommended to act as a mercurial and stimulate the absorbent system; but I have not seen any advantages result from its exhibition in this way. To direct particular attention to the condition of the alimentary canal, it is only necessary to state, that obstructions or derangement of it, and of the liver, have obviously, in many instances, appeared as the cause of the disease.

From the use of Tinct. Digital., which has been highly spoken of, I have never, in this affection, observed any beneficial result. A great objection to its exhibition is, its tendency to induce derangement of the stomach, which ought to be sedulously avoided. Far safer diuretics for children are, solutions of the super-tartrate and nitrate of potass, phosphate of soda, and occasional doses of nitrous æther. When the arterial system is not much excited, antimonial powder

may be very advantageously combined with calomel, or frequent doses of antimonial wine may be ordered to produce diaphoresis; but the preparations of antimony must not be exhibited to the extent of causing nausea.

The external means which have been resorted to are, the application of leeches, various stimulants in form of frictions, and the evacuation of the contained fluid by an operation. It is in the early stages of the disease only, that symptoms show themselves which may be benefited by local detractions of blood; and whether the excitement be local or general, the use of leeches to the lower part of the occiput, and the angles of the inferior maxilla, is a measure from which, when judiciously conducted, much advantage will often be derived: the child must be watched while the blood is flowing, and the effusion suppressed whenever it begins to diminish the energy of the pulse; but a moderate impression, wherever there is sufficient vigour of body, should always be made on the vascular system. The effusion from leech bites may be suspended at pleasure by the slightest touch of the Nitrate of Silver.

All local stimulants have a chance of being useful, more especially when the effusion is seated near the surface, or between the membranes and the cranium, from such remedies possessing a tendency to excite the action of the absorbents. Frictions on the head and spine, after the former has been shaved, either with the ointment of the tartrate of antimony, or that of mercury, have been much extolled. One or other of these applications should be made morning and evening. Frictions, with the juice of garlic or onions, mixed with lard, have all been recommended. Blisters I can mention favourably, for I have known them, in many cases, productive of great advantage. They should extend from the lower part of the occipital bone to one or two inches below the shoulder. On a child under the age of two years, their application should not exceed three hours, when a warm cataplasm must be substituted, which will cause extensive vesication and a copious effusion of serum.

The removal of the water by puncture is the last remedy. Besides the successful case by Dr Vose, in the Med.-Chir. Transac. Lond. vol. ix., other examples have been recorded, in which this operation succeeded in permanently removing the disease. In the Lond. Med.-Chir. Rev. July 1838, a table of nineteen cases is given by Dr Conquest, of which ten were alive when last heard of, four of them permanently relieved, and nine known to have died. In 1821, I witnessed this operation eighteen times in one child, from whose crani-

um, on these different occasions, seven pounds, three ounces, and three drachms, were abstracted. A small trocar and canula were pushed through, in one or other of the *lateral angles* of the bregma. At first, the child seemed to improve, but it was ultimately cut off by the joint irritation of the disease, and that of dentition. Whatever success may attend this operation before the bones of the cranium have acquired solidity, before dental irritation has commenced, or in cases of short duration, we have little to expect from such an operation under the reverse of these circumstances, especially when the disease is of long standing, for the texture of the brain is so much destroyed, that its regeneration could not be expected. Dr Conquest remarks, that in no instance has clearly marked congenital disease been permanently benefited; that those cases have done best in which effusion manifestly resulted from inflammatory action, and in which cerebral excitement followed the operation. We are to be regulated regarding the necessity of repeating the operation, by the symptoms. During the flow of the water the head is to be embraced and moderately compressed by the hands of an assistant; and after the operation it requires to be supported by a properly adjusted bandage, or an elastic cap. No more fluid is to be removed at each operation than what the powers of the system can support, which is to be judged of by the condition of the pulse. The largest quantity removed by Dr Conquest at any one time was twelve ounces. The canula, which may require to be advanced two inches beyond the external surface, may be blocked up by a portion of brain, and require a probe to be passed through it, to remove the obstruction.

When the complaint threatens, the gums, skin, and excreta should be examined; and the former covering teeth in the act of protruding, divided by a crucial incision. Sometimes the disease has no other foundation than the irritation arising from want of personal cleanliness. In such cases, ablution with tepid water, morning and evening, over the whole body, with frequent changes of clean clothes, should be ordered. By the careful examination of the excreta, worms of some kind may be detected; and while their presence has led to the disease, it is equally certain, that their removal has often arrested all irritation. When they are known to exist, an enema, containing a proportion of Ol. Terebinth. Vol. speedily dislodges them. Since, in children of strumous ancestry, the complaint has proved fatal to several of them in succession, measures should be adopted from the moment of birth, to eradicate or diminish the tendency to it. A judi-

cious precaution, where the indulgence can be procured, is to have the child reared in the country, by a woman of sound constitution. In cold weather, or during indisposition, tepid water should be used for ablution; but in the warm months, and when the child is in health, a single plunge in cold water, or merely spunging the body with it, should be preferred. Flannel next the skin should be worn until after the evolution of all the deciduous teeth; until after this period also, he should be restricted to milk and farinaceous diet; and be, as frequently as circumstances will admit, in the open air.

Hydro-rachitis.—Spina bifida is occasionally conjoined with the foregoing subject. It consists in a tumour from the size of a walnut, to that of a small orange, on some point in the course of the spine; and though almost always a congenite affection, yet some cases are recorded where it appeared after birth. Its most frequent seat is the lumbar portion; but I have seen it in all the divisions of the spine, even at the termination of the coccyx. Sometimes the tumour bursts during parturition; but when entire, it appears flat, slightly oval, depressed in the centre, and its colour may be dark or pellucid. The common integuments, unusually attenuated, constitute its covering. Its contents are serous; and that portion of the spinal canal, and of the medulla immediately subjacent to the tumour, are imperfect. Generally, the spinous and transverse processes are wanting; and so also is the medulla; but where the vertebræ become complete, the latter either reappears, or transmits large branches from its termination, to be distributed on the inferior parts. In some instances, one or more vertebræ are wanting, or they are merely separated from each other at the defective point. Though this lesion be generally limited to a circumscribed portion of the spine, yet I have seen cases where all the dorsal, and a portion of the lumbar column, were involved. In some instances, no defect is to be discovered in the spine.

The prognosis must always be guarded. When the defect is connected with greater deformities, as distortions of the pelvic limbs, protrusion of the brain, or with hydrocephalus, the case is hopeless. The connection between these swellings and the brain is sometimes very intimate, as may be proved by the pressure of the hand upon the former, throwing the child into a state of coma, of which I was an eye witness where the patient lived to the age of nine years. When the infant is vigorous, and the deformity not complicated with any other lesion, greater hope may be

entertained. Accordingly, there are some examples, of which I myself witnessed two, where patients not only recovered,* but where one with a tumour as large as an infant's head, emanating from the extremity of the spine, survived, the swelling gradually disappeared spontaneously, and at the end of two years the infant was in perfect health. In unfavourable cases, death often ensues some time within the first month.

In the treatment, I see no advantage that can accrue from returning the tumour into the spinal canal, as some have advised. It might be burst in the attempt, or if it were accomplished, injurious pressure might be exerted on the medulla. When the infant is delicate, the tumour should be covered with a mercurial plaster, thickly spread, and sufficiently large. From the result of my own observations, and the favourable termination of the foregoing case, puncturing it occasionally with a needle, as recommended by Sir A. Cooper, should be deferred for the first four or five months after birth, that the child may acquire vigour, and the nervous system become less susceptible. While in bed, the infant should always be laid on either side, to diminish the risk of injury from pressure.

Morbus Cæruleus.—In infants thus affected, the general surface, especially the countenance, presents a kind of livor, which becomes of a deeper hue during exertion, or passion. The countenance is dull, breathing hurried, in some instances the air emitted remarkably cold, and the temperature of the body also, is below the natural standard. Frequently, there is a troublesome convulsive cough, which is excited by any motion on the part of the child. Infants in this state never become robust. At one period, it was a general notion that this affection invariably had its origin in the foramen ovale continuing pervious after birth; but it has long been proved that it may arise from any congenital deviation in the natural structure of the heart, or the large vessels arising from it, which permits the whole, or far the greater proportion of the blood, to pass immediately from the right to the left side of the heart, without traversing the lungs; besides the condition of the *foramen ovale*, the ductus arteriosus continuing pervious after birth, the aorta arising from the right and left ventricles at the same time, or coming off from the right instead of the left ventricle; and an aperture in the septum ventriculorum, have all been ascertained to have produced cyanosis. Such cases are perfectly hopeless.

* Morgagni, lib. i. epis. xii. Lond. Med.-Chir. Trans. vol. ii.

Nævus Maternus.—These are marks of various sizes and shades, which may be observed on different points of the surface; and when they appear on the face, often have an unpleasant effect. They are ascribed to some disorganization of the subcutaneous vascular net-work, as a varicose condition of the smaller veins, or an aneurismatic state of the minute arteries of the part. When they are seated on the countenance, especially in females, a great anxiety is naturally manifested to have them removed; to accomplish which, the excision of the part, or the insertion of vaccine into it, have both been recommended; but the former of these methods would be productive of a more unpleasant deformity than the one which it was intended to remove. Frictions with Ung. Tart. Antim. have, in my own practice, led to the obliteration of such marks on the body, after having excited a successive crop of pustules; and repeated vesication of the part has also proved successful.

Aneurism by anastomosis.—This affection is sometimes not so large as a pea, of a vivid red colour, and elevated above the skin. It may be situated upon the temple, or any part of the body. As it enlarges rapidly, it should be early arrested, by applying to the thickest part of the teguments which cover it, the Potass. Fus. The aneurism must be previously covered with adhesive plaster, in which an aperture is formed to permit the application of the escharotic, which may be required oftener than once. Its action is confined by the plaster. The obliteration of the vessels requires some weeks. There are several other methods of removing this affection, but the one described is far the safest.

Syphilis.—The system of the fœtus may be contaminated at the moment of conception, at some period during gestation, parturition, or lactation. When there are ulcers on the external genitals, the fœtus may be infected at birth. Either parent after seeming, for a long time, to be cured of the disease, may nevertheless procreate children tainted with syphilis; and the healthiest infant may be infected at any time by a diseased nurse. But what may appear inexplicable, is, that instances are related by practitioners of the first authority, of the fœtus having escaped contamination altogether, even when the female parent was known to be syphilitic. As all adult subjects, however, are not equally susceptible, may not the same insusceptibility be also occasionally found both in children and in the fœtus *in utero?*

The virus exerts very little, if any, influence in retarding the development of the fœtus in the *early stages of pregnancy;* for it not only increases in volume, but its movements

are vigorously felt while living. If born alive, it continues so only for a few hours or days, seldom weeks, when it is carried off by convulsions. In some instances, I have been led to observe, that in each successive pregnancy the fœtus was longer retained, seemed far more vigorous at birth, and presented less evidence of disease; the morbid action appearing to exhaust itself, without the use of medicine. In other examples, however, the malady seemed to be gaining ground with each successive gestation; for, on the first occasion of my attendance, the fœtus was born alive, while the succeeding ones were expelled in a putrid state. In some cases again, not a vestige of the disease can be detected at birth, the child appears plump and healthy, and continues so for several weeks or months, when, unexpectedly, blotches appear on various parts of the body, and he is suddenly cut off by convulsions. Far more generally, however, when the fœtus is born alive, he is delicate and emaciated, presents a wrinkled sallow appearance of countenance, which is so striking a representation of old age in miniature, as not to be readily overlooked by a practitioner who has once attended to it; and the disease itself in form of pustules, ulcers, or eruption, may be seen on some part of the body. When the fœtus has been destroyed *in utero*, the cuticle is corrugated, while it also appears as if it had been macerated. The appearance of the cuticle, however, cannot be depended on; for the same condition will be observed in every case where the fœtus has been retained for some time after the extinction of life.

The *diagnosis* is difficult when the fœtus is still-born, and presents no evidence of disease. Where any of the phenomena already described are observed, and when abortion is repeated while the fœtus is still-born, or much emaciated, and dies shortly after birth, a proper investigation of the previous history of the parents will seldom fail to disclose the nature of the case. The difficulty is completely removed when an infant is born alive, and the disease apparent, which is so characteristic, that no one who has once seen it can be mistaken. A practitioner may certainly be deceived, when an infant has been born to all appearance healthy, but where, nevertheless, he is cut off at the lapse of days or weeks unexpectedly by convulsions, and that too without any visible morbid appearance.

Generally speaking, when the fœtus is born with syphilis, the disease is limited in its extent. The genital organs are at first its most frequent seat, where it shows itself under the form of an extensive excoriation. This, for a day or

two, attracts little notice, until scaly copper-coloured blotches are seen on the nates, and soles of the feet; whence it extends to other points of the pelvic extremities, as also to the groins and umbilicus. Every part of the body is ultimately covered by copper or livid coloured blotches; which, upon the neck and face are dry, but humid on every other region. The pustules may be flat or prominent, suppurate quickly, and dry up without bursting. The external mucous tissues, as the linings of the eye-lids, nose, and mouth, and of the vagina in female children, become affected. On the head at birth, the hair is like down, though on the body it be long and strong. Inflammation seizes the palpebræ, and extends to the coats of the eye, which ulcerate, and vision is soon lost. An ichorous discharge flows from the nostrils in both sexes, and from the vagina in the female. Ulcers appear on the lips and inside of the cheeks, and from an early period the infant is hoarse, which is one of the principal features of the disease. When he is contaminated by the nurse, deep chops or ulcers form round the nipples; and thereafter they are developed on the lips and tongue of the child, among the first parts. If at birth the infant be affected in its transit, from ulcers on the external genitals of the parent, the disease is then more likely to show itself on him in the same form, on the genital organs, and around the anus; and from these points also, fungous excrescences occasionally originate. The period which may elapse before the malady begins to appear, when so communicated, is various; generally, however, it shows itself some time within ten days.

A guarded *prognosis* is required where the disease is in an advanced stage when the infant is born, as it is generally fatal. The child becomes emaciated from inability to embrace the breast, owing to the ulcers on the lips and other parts within the mouth, and fatal convulsions sooner or later supervene. When the disease extends over the body in form of pustules or ulcers at birth, it generally proves fatal; for, when thus far advanced, it can seldom be arrested by medicine. A case in which syphilis is limited to the erythematous state is generally remediable by proper treatment. Syphilitic children should always, if possible, be nursed by the parent, if it were merely to prevent the exposure of family secrets. The nurse rarely escapes the disease, and when it is communicated to her, chops or small ulcers form around the nipple; or one or two copper-coloured blotches show themselves on either mamma.

The *removal* of this affection is somewhat difficult; for it will sometimes reappear repeatedly after every vestige of it

ceases to be visible on the surface, and though remedies may have been long continued. When appearances, in any case, leave no room to question the nature of the malady, mercury in some form should at once be commenced. Calomel, from its being so easily administered, has generally had the preference; though, from many opportunities of exhibiting the blue mass to young patients, I am satisfied it produces less irritation. To new born infants, Calomel, to the extent of a quarter of a grain, should be given every night, in treble the quantity of loaf sugar. When regularly exhibited, it possesses the power of causing the disease to disappear with great celerity. To ensure its complete removal, however, the drug must be continued for at least three weeks after all traces of discoloration on the skin have vanished. In the progress of the treatment, the medicine must be very gradually increased to the extent of half a grain daily, for at least ten days before it is discontinued.

Great care must be observed in exhibiting mercury to infants or children, lest it be carried the length of causing too much irritation. In them, though it rarely excites ptyalism, this however may happen. When the mouth becomes hot, and there is frequent inclination to void the stools, some mild laxative must be administered, and the mineral discontinued for a few days. If the dejections be thin, accompanied with straining, Chalk Julep, containing a portion Tinct. Opii, should be given; and the tepid bath used, night and morning. Constipation sometimes takes place during the exhibition of Mercury, and in infants especially, this must be obviated by Ol. Ricini, or mild enemata.

Frictions, with Ung. Hyd. on the thighs, have been proposed to remove syphilis in children, but it is productive of so much irritation on the part, that it can never be a substitute for Calomel by the mouth. It has likewise been advised to limit the exhibition of the mineral to the nurse; but it seems much safer to give it to the infant also, and this, under proper management, can be done without risk.

Skin-bound Disease.—We had no correct information regarding this affection, until the early part of the last century, when it was noticed by André of Ulm; since which period it has been described by Drs Underwood and Hulme of this country, and Dr Doublet of Paris. This last author states, that he observed it chiefly in children who were weakly, emaciated, and born of sickly parents; and my own experience, though it has been limited, corresponds with that of M. Doublet. It most generally shows itself during the winter season, and more frequently among the children of the poor

than the progeny of families in affluence; but I have seen it under both these circumstances. Other authors again state, that they have observed it in healthy robust children. It has been ascribed to the influence of cold, but I do not think that we are yet acquainted with its causes; and to this last it certainly cannot always be ascribed, since it has been seen in infants at birth, as happened in the cases which fell under my notice. In accordance, however, with the notion, that cold is the principal exciting cause, the children in whom I saw it were born in winter.

Although in some instances this affection has been observed at birth, yet in others, several days, weeks, or the whole of the first month even, elapsed, before it showed itself. It is no less variable in its extent; for sometimes the whole of the body is affected, while in other cases it is confined to the trunk, but more frequently the pelvic extremities, when it may be considered a mild complaint. It generally appears without any previous warning, except that the child seems agitated and moans feebly. Fever is rarely present, but occasionally diarrhœa. The skin which covers the indurated portion appears purple, sometimes the colour is deeper, approaching to violet, not unlike the aspect of a part that is affected with erysipelas. More generally however, the colour of the skin inclines to a shade intermediate to white and yellow. On points where this tissue is naturally loose, we find it, when diseased, so fixed that it ceases to move over the subjacent muscles; and to the finger it conveys a hard resisting, but not generally an œdematous feel, though in some rare instances it pits slightly. The child always feels cold, and presents a sickly appearance of countenance, indicative of approaching dissolution.

In the hospitals of Paris, where the disease has made much more frequent visits than in similar establishments in this country, it has appeared under a severe form. It was often complicated with erysipelas and tetanus; the former rarely took on the suppurative process, but occasionally ended in mortification. The lower extremities became œdematous; and the young patient sank some time between the third and seventh day after delivery. Among delicate children in this country, a chronic form of the disease is sometimes observed from birth: the whole skin is scaly, slightly herpetic, very tense, rigid, and glossy; but in some instances, these conditions affect only the teguments of the jaws, neck, and those which cover the joints; and such parts of the surface as are in this state, incline to a yellow colour. The child refuses the breast, pines away in a few days, or is suddenly carried

off by fits. In other instances several weeks elapse before this event, during which the infant is observed not to thrive, and the skin to be of a wheyish colour. When this affection is confined to the extremities, the infant generally recovers; and his taking the breast may be considered as a favourable sign ; but when the face or the abdomen is the seat of morbid action, or when it extends over a great part of the body, and breathing is difficult or laborious, the termination is commonly fatal. An incision into the diseased part gives exit to an abundant effusion of fluid of a deep yellow colour, which, on being dropped into boiling water, concretes. In some instances the vessels of the brain have been found turgid. In the cavity of the abdomen, the liver has appeared enlarged, the veins greatly congested, the gall-bladder distended, and the mesenteric glands of preternatural size.

A great variety of remedies have been recommended in this malady, but few of them have been of service. In two cases which fell under my care where the disease was confined to the lower extremities, the children were much benefited by frictions with Ol. Camph., twice daily, with which warm clothing was conjoined. The great object in every case is to excite the action of the skin, and in chronic examples especially, to infuse additional vigour into the system. The warm bath should be used regularly morning and evening, and the body cased in flannel. Decoction of Sarsaparilla has long been recommended, with small doses of Vin. Antim. alternated by Spt. Æth. Nitros. ; but we must sedulously avoid exciting nausea or vomiting. Small doses Submur. Hyd. with Pulv. Antim. have been found useful. For laxatives, the Sulph. Potass. c. Sulph., in form of electuary, should be tried. No remedy can be more eligible than frictions.

CHAPTER IV.

DISEASES OF THE CUTANEOUS TISSUE.

Excoriation.—Delicate infants, and such as are of a full habit, are most liable to this affection. Want of cleanliness, and a certain state of the fluids may induce it. The points most liable to be affected are those where two surfaces are in contact, as behind the ears, around the neck, in the axillæ, and between the thighs.

When these complaints, trifling at first, are neglected, ul-

cerations succeed, and the infant is suddenly cut off by convulsions. Results so unpleasant may easily be avoided by scrupulous attention to cleanliness. In addition to the morning ablution, the parts liable to excoriation should also be bathed in the evening, and the body linen daily changed. When any point is excoriated, it is to be covered by a piece of muslin, previously immersed in one part of Vin. Opii and two of water, and renewed in the evening. This remedy seldom requires to be continued longer than two days; or if it fail, Ung. Nitr. Hyd. diluted must be tried. When ulcers form, the best application is a warm poultice, which must be frequently renewed, while the remedy already recommended is to be placed next the sore. In full infants, a mild laxative should occasionally be given.

Strophulus.—This consists of a subacute, cutaneous, papular eruption in young infants. It commences between the third and seventh day after birth, and few escape it. It is said to be occasionally present during dentition, which is the case with some of its varieties, but there are others that are never seen at this period. Of this complaint Dr Willan has five varieties, all of which may be seen in one subject, viz. the Strophulus intertrinctus, albidus, candidus, confertus, and volaticus. Of these the first is by far the most frequent, and next to it the second.

Strophulus intertrinctus presents itself under the form of red prominent pimples on the cheeks, dorsal surface of the fore-arms, chest, abdomen, and hips. Sometimes they coalesce into large patches, especially on the body and thighs. In other parts they are sparsed, and in the interstices, an inflammatory blush appears. The patches may be present for three or four days before any other derangement in the health shows itself. They recede in a shorter time than we might be led to expect, considering their number and prominence; they rarely continue longer than four or five days, when the colour becomes less vivid; and shortly afterwards they desquamate. This variety is apt to be confounded with measles, but the total absence of all catarrhal symptoms marks the difference. *Strophulus albidus* consists in small, white, prominent papulæ, which are sometimes surrounded by an inflammatory blush. It shows itself principally on the face, neck, and chest; and generally continues longer than the former variety. *Strophulus candidus* appears in large white papulæ, which are generally paler than the rest of the surface. Their base may or may not be surrounded by an inflammatory blush. The papulæ present a shining surface, are much scattered, and chiefly occupy the shoulders, arms, and

loins: they disappear in a few days. *Strophulus confertus* is not so vivid, but smaller, less confluent, and more permanent on the face than the intertrinctus. On the trunk of the body, the papulæ are larger, but not so confluent. The patches vary from the size of a sixpence, to that of an infant's hand. When they appear on the lower extremities, they occasion excessive itching. Successive crops of them may be developed on the thighs, nates, and loins, more especially when the young patient is neglected in point of cleanliness. This variety also, from the appearance of the eruption, and its being preceded by sickness, has often been mistaken for measles, but there are no catarrhal symptoms. *Strophulus volaticus* developes itself in successive small circular patches, on the face, trunk, and extremities. Their colour and that of the skin in their interstices, is vivid. In four or five days they fade, and shortly afterwards desquamate.

The chief cause of strophulus, is the too long retention of the meconium. Want of personal cleanliness, and neglecting to change the clothes of the child sufficiently often, is another frequent cause; and to these we may add, early artificial nourishment. Mental emotions, or whatever may interfere with the healthy and natural secretion of the milk, may cause this affection. The immediate cause is, irritation of the mucous tissue of the digestive organs, particularly of the stomach and intestines. Unless we admit this, the *modus operandi* of almost all the exciting causes I have particularised cannot be satisfactorily explained. The third and fourth varieties are sometimes encountered during dentition; and the fifth more frequently at this, than any other period.

Generally this is a benign affection. Our treatment is extremely simple. In the *first* place, the bowels should be effectually cleared out once, by equal parts of Rhubarb and Magnesia, which, under the present circumstances, are preferable to oily laxatives. In the *second* place, bodily cleanliness must be strictly attended to; and with this view, the tepid bath should be used morning and evening. In the *third* place, the young patient must be kept moderately warm, to prevent premature retrocession of the eruption. In the *fourth* place, if the child be allowed any artificial nourishment, it must be entirely withdrawn until the eruption has ceased; and his access to the breast even, must be less frequent. In the *fifth* and last place, the bowels of the parent must be properly regulated, her apartment freely ventilated, while she is to be cautioned against such causes as may have led to disturb the secretion of milk. The infant

must not, under the present circumstances, be frequently ordered aperients: we trust chiefly to the other remedial steps.

Psora.—This affection consists in numerous small watery vesicles, which are at all times attended with more or less itching, especially when the subject is warm; the disease may appear in any climate, and attack individuals of any age; but children, and persons oppressed by poverty, seem most disposed to it. In the former, the vesicles incline to a red colour; but in adults, they retain that of the skin; they first appear on the wrists, between the fingers, on the back, and thereafter, on the thoracic and pelvic limbs, and the body generally. Though this eruption is admitted to be extremely contagious, yet Mouronval informs us, that he failed to produce it by inoculation. Inattention to cleanliness seems the principal cause; and its presence may be supported by a heating diet, which will probably explain its frequent appearance among children who are fed on oat meal, and on salted fish. Dr Willan admits four different varieties, viz., scabies papuliformis, lymphatica, purulenta, cachectica. The *first* consists of small watery vesicles like those of lichen, which are extremely itchy; the *second* are much larger, have no inflamed base, they may suppurate, or even ulcerate, and are very itchy; the *third* are not unlike variola, they are the size of a split pea, contain yellow matter, are very itchy at the commencement, ulcerate, have an inflamed base, and, contrary to the opinion of Dr Willan, may be developed on the palm of the hand, and betwixt any of the fingers; the *fourth* exhibits a combination of the former varieties, may appear in either child or adult, is often a degeneration of the first and second kinds; with the exception of the hands and legs, it may be developed on any part of the limbs and trunk, and appear in persons otherwise enjoying good health, as well as the cachectic. I never saw derangement of any function in this complaint, nor have I ever heard of any case being fatal. Though long disputed, it was in 1812 satisfactorily demonstrated by M. Gales, that an insect exists in the vicinity of each vesicle; but it is yet a question whether the insect be the cause or consequence of the eruption. *The treatment* consists in strict attention to personal cleanliness, in avoiding such articles of food as are likely to support the presence of the complaint, as salted materials, fish, all unctuous matters, and irritating vegetable substances. Sulphur ointment as an external application, is a certain remedy; but its unpleasant odour is a strong objection to it; any one of the following, however, will be found equally successful, viz., a

diluted solution Hydriod. Potass., one drachm Acid. Sulph., and an ounce Adip. Suil., or with the same proportion of the latter, a drachm Helleb. Alb., or a similar proportion Hyd. Præcip. Alb. A small quantity of either of these should be rubbed over the whole body four nights in succession, when the cure may be considered complete. The internal use of Acid. Sulph., and Sulph. Potass. c. Sulph. as an aperient, will greatly promote the cure. To eradicate the disease effectually, all necessary precaution as to cleanliness, should be observed.

Tinea.—This disease has been divided by authors into five, sometimes into seven varieties; but the microscopic researches of Gruby have shown, that the marks which were believed to characterise distinct species, are merely changes which take place in the same disease, at different periods of its duration. He was the first to draw the attention of the profession to the fact, that tinea consists in the development of a parasitic fungus between the layers of the epidermis, generally of the scalp, although not solely confined to that region, and that it was not pustular: pustules, however, most frequently co-exist. The first symptom of the disease is a desquamation of the epidermis, after which, in the course of a few days, numerous small bright yellow spots may be observed; these are the capsules containing the plant. When they are taken out from the skin unbroken, rendered transparent, and examined with the microscope at a low power, they are frequently seen to be traversed by hairs, which project to a considerable distance beyond the wall of the capsule, that was situated next the true skin. It is then seen that the bulb of the hair, although at times involved in the disease, is most frequently at a considerable depth below it, and totally unaltered, thus refuting the idea, that tinea originates in the hair bulb. The capsules gradually increase in size; at first their circumference is raised above the level of the central portion,—this gives their upper surface a cup-like shape,—and several capsules growing close together, their walls are compressed, they lose their rounded form, and become either hexagonal or elongated, and hence have respectively received the terms *favosa* and *lupinosa*. As the capsule enlarges, the central portion gradually rises, the layer of epidermis covering it cracks, and a white floury, furfuraceous, fungous-looking mass, composed of the sporules of the plant, projects from the fissure; this by degrees increases and expands, until the central portion ultimately rises above the circumference; as the capsules enlarge, and these changes advance, all regularity of form is destroyed, and the scalp is

covered by a dense, thick crust, constituting the *tinea mucosa* and *scutulata* of dermatologists. The disease has been termed *granularis*, when the crusts are disposed in small scattered points, over different parts of the scalp, and *annularis* when they are arranged in rings; they exhale an odour resembling that of the urine of cats, and present a most unsightly appearance. The disease shows itself on points of the skin under which the cellular membrane is dense; generally commences on the scalp, spreads to the temples, eyebrows, forehead, but more rarely to the shoulders or forearms. Rayer has seen it extend along the back to the sacrum, knees, and the outer and superior parts of the legs. The skin, in the intermediate spaces, is sometimes sound, at others erythematous, or covered with furfuraceous scales. When the scabs are detached, the subjacent points present small, superficial, reddish, lenticular excoriations, and are much disposed to a renewal of tinea. The cutis is denuded and inflamed, but not ulcerated even under the crusts. After the separation of the latter, their points of attachment yield a yellow viscid fluid, which, in drying, assumes the dimensions of the original crusts. In protracted cases, all the tissues of the scalp become diseased in succession; we may have inflammation of the skin, hair bulbs, cellular membrane, periosteum, lymphatic glands, and *pediculi* innumerable. Sometimes tinea is complicated with ophthalmia, coryza, inflammation of the stomach and intestines, and even mental debility. When other parts than the scalp are attacked, the disease does not penetrate so deeply, is less disposed to ulcerate, and is more easily cured. Baldness, partial or general, is a sequela of tinea. This is the most frequent affection of the scalp, and may appear at any age, or in either sex; but it is most frequently seen in the seventh, eighth, or ninth month, in children still on the breast.

Among *the causes*, contagion has long held the first rank, but however criminal it may be considered to question an opinion which has been so universally received, it has, for a considerable period, been my belief, that there are many other circumstances which are fully, if not more influential in producing tinea, than contagion, as residence in an impure atmosphere, want of personal cleanliness, unwholesome food, and surfeiting. We hear much of the disease arising in boarding-schools from children using the same comb, towel, or article of clothing, but if the nature of the diet, atmosphere, personal attentions, and the number of young persons congregated into one small sleeping apartment of such establishments were considered, the prevalence of the disease

could be more rationally accounted for. Several observers have attempted to produce favus in the living body by inoculation, but every instance except one by Remak proved unsuccessful. Another absurd notion is, that the complaint is local; but whoever attempts its removal by mere local means will soon discover their error; and the advocates of this opinion seem altogether to have overlooked that the disease is frequently complicated with gastric derangement.

In the *treatment*, much patience is required to bring so obstinate a disease to a favourable issue. The internal remedies are laxatives, and suitable regimen; and the external, the segregation of children where contagion is suspected, scrupulous attention to cleanliness, and proper remedies to eradicate the complaint. The most eligible laxative is Sulphate of Potass with Sulphur, alternated with Calomel, and Rhubarb, combined with small doses of Ipecacuan, or Antimonial Powder. For older patients, Senna, with some saline cathartic, is proper; and the decoction of Sarsaparilla is highly useful. For nourishment, if the child be still on the breast, and also accustomed to food, he should be allowed beef-tea, perfectly void of fat; or, if he be older, a light animal diet. When the disease appears in an infant reared on the milk of a woman who menstruates, another nurse should be substituted. Among the first steps, a young person affected with tinea ought to be separated from other children, to prevent the disease being transferred to them. The second step is to cut the hair short; and the third, to have both it and the crusts removed.

In one or two nights at most, the whole scabs are detached by a poultice of three parts of oatmeal pottage, and one of soft brown soap, mixed on the cloth, and applied at bedtime. When the crusts have been removed, and the hair cut close, the application of an ointment, containing two drachms of Subcarb. Potass. to an ounce of lard, is found of much benefit; and a lotion of that alkali may be at the same time employed; but the most useful of all applications is the Ioduret of Sulphur ointment, first proposed by M. Biett, rubbed gently over the parts night and morning. Lotions of Sulphuret of Potass, Sulphates of Zinc and Copper, Nitrate of Silver, Chloride of Lime, Cod Liver Oil, and Creasote, have all been useful in certain cases, but not with such uniform certainty as would induce us to recommend them; and in regard to acrid applications, we must be regulated by the degree of local excitement. Mahon of Paris acquired great celebrity, as stated by Rayer, in the treatment of this disease by means of ointments contain-

ing Sulphurets of Antimony and Lime; by which in seven years he cured 900 patients; and in all of them the hair reappeared on those points whence it had fallen. I have myself, after the scabs had been detached, as recommended, found ablutions with tepid water and mild soap, night and morning, followed up by the use of an ointment, composed of four ounces of Lard to two drachms of the Oxide of Zinc, extremely beneficial. The water, well impregnated with the soap, is to be simply poured upon the part, which is *not to be rubbed*, even with a towel. I do not approve of the comb, nor of frictions in any form; but keeping the hair short is indispensable. The frequent use of the warm sulphuretted bath, will be highly serviceable, and also the abstraction of blood, either locally or generally, according to the age and vigour of the patient. A small blister, at a little distance from the seat of morbid action, is a useful remedy.

Purpura.—This affection is not peculiar to children, but may also be seen in older subjects. Such of the former as are weakly, improperly nourished, and reside in damp, ill ventilated habitations, are the most liable to it. It commences by the formation of spots, the size of large flea bites, of a purple, violet, or livid colour, unaccompanied by any other disturbance, and not at all elevated above the skin. They begin on the legs, and thereafter are seen on the thighs and arms, whence, in the space of ten or fourteen days, they extend and rapidly increase in number, without becoming confluent; but the body, face, and neck, are less frequently their seat. Their disappearance is slow and successive, and at the time, their colour changes to brown, and ultimately to yellow. This affection may be presumed to originate in some condition of the blood-vessels, or of their contents, and effusion into the reticular tissue; the author has never seen it until after weaning. There is a *second variety* of this affection, which is of a more formidable nature; it also may attack adults as well as children; the spots are larger than those of the preceding; first appear on the legs, and thereafter on other parts; are preceded by languor, accompanied by vibices, and there are discharges of blood from the nares, mouth, alimentary canal, and vagina. *In autopsies*, livid spots are seen on all the mucous tissues, between the layers of the mesentery, under the peritonæum, pleura, and pericardium; with effusions into the cellular membrane. The first variety is so mild, that it often disappears in two or three weeks, without any medicine; at most, Calomel as an aperient, mineral acids, a generous diet, country residence, and

moderate exercise in the open air, are sufficient. The second variety is generally a protracted disease; and besides the remedies recommended in the first, it requires for its removal the use of wine, Quinine, and some preparation of iron, of which the Tart. Ferri et Potass. is the most eligible; at the same time we select the mildest aperients, which are only to be used when required. According to Rilliez and Barthez the local application of compresses dipped in Acet. Acid., Sol. Acet. Plumb., or Alcohol Camphor., has been found beneficial.

Roseola.—This affection merits attention, chiefly from its resemblance to measles and scarlatina, with which, at first sight, it is apt to be confounded. It appears in patches of different forms. The efflorescence is not distinctly felt above the surface, it is but a mere blush. At the commencement there is, in some cases, slight acceleration of pulse, hurried respiration, heat of skin, and gastric derangement. These precursors may continue several days before the blush on the skin is developed. The eruption may be general or partial. Frequently at first, it is seen on the face, neck, breast, and extremities, towards night; and its colour becomes more vivid in the course of the following day, when it will be found, perhaps, to have extended to the trunk. It shows itself in small patches of about six lines in diameter, which are irregular in their shape, being round, oval, or in form of rings. On the second day the vivid blush continues on the parts affected, but from this time it becomes more of a rose colour. When the skin is very bright, the fauces are found of a similar shade, accompanied by roughness and itching, but no pain in swallowing. The cuticular efflorescence rarely continues after the fourth or fifth day; more frequently, indeed, it is not visible after the third. Occasionally patches of a deeper hue, with a disposition to vesication appear, when the others are subsiding.

This affection seems frequently to be connected with gastric or intestinal derangement, while in other instances, we cannot ascribe it to anything of this nature. The irritation of dentition may lead to it, but in such cases, the rush seldom continues visible longer than a day. It may be distinguished from measles and scarlatina by the mildness of its fever, and the total absence of pain in deglutition and of catarrhal symptoms. The prognosis, except in plethoric children, may always be favourable; and in them delirium or convulsions have sometimes been observed. In regard to treatment, generally nothing more is required than an occasional dose Pulv. Rhei., and Carb. Magnes. combined; mild

liquid food in a tepid state; the warm bath; and the clothing to be such as to prevent the sudden retrocession of the eruption. Oat-meal diet should be avoided during the continuance of the eruption. The body linen must be frequently changed. In cases attended with much cerebral excitement, leeches are to be applied to the back of the neck, and brisk cathartics administered.

Erythema.—This affection differs in several respects from rose or erysipelas; there is little if any fever, it is seldom that any function is deranged, there is no diffuse swelling, nor tendency to the formation of vesicles. By passing the finger along the inflamed surface, it feels rough as if it were beset with papulæ, but this condition shortly subsides. Most generally it shows itself on the nates, thighs, and external genitals. It may appear, indeed, on any point under the clothes, where an undue degree of friction has been excited. The inflammatory blush observed around the vaccine vesicle, from the eighth to the eleventh or twelfth day of the disease, constitutes a good example of erythema. When it appears on other parts of the body, particularly the nates and thighs, it may generally be ascribed to neglect. It is rarely troublesome. Full infants are more liable to it than those who are weakly, and more especially children of fair delicate skin.

In the treatment, little more is necessary, in most cases, than scrupulous attention to cleanliness, by frequently changing the napkins of the infant; tepid ablution of the parts affected, evening and morning, dusting them with Carb. Zinc. Impur. after they have been bathed. With these means, the occasional use of mild laxatives must be conjoined, more especially in stout children. When the part ulcerates, a carrot poultice is the best application.

Erysipelas.—This affection is occasionally observed among infants. They are not, however, very liable to it, for they are not exposed to those causes which excite the disease in adults. For one or two days before any thing is observable on the skin, the child is remarked to be fretful, to moan, to be indifferent regarding the breast, to be very torpid, and start during sleep. The tongue is covered with a lemon-coloured fur, and the white part of the eyes presents the same shade. An inflammatory blush is seen on some part of the surface, most frequently the scrotum in males, or labia pudendi in females, whence it migrates extensively over the nates. There is heat and diffuse swelling of the part affected, and the redness of the skin recedes by the pressure of the finger, but returns immediately after the pressure is removed. When the genitals are the seat of disease, the

swelling is greater than when other points are affected, and sloughing of the labia or scrotum occasionally supervenes. From the fourth to the seventh day the child dies convulsed. Previously to this, however, the abdomen is tense, and there are frequent alvine dejections, or obstinate constipation.

This is a most dangerous disease in infants, but less so in males than in females, as in the latter it is apt to extend into the vagina, and attack the abdominal viscera. When the disease is confined to the extremities it is not so dangerous; and it is less so also, the further the subject is removed from infancy. Sometimes the inflammatory action commences on the neck, and though here it often terminates in suppuration, yet the event is generally favourable. On dissection the liver and other organs may be found covered with a preternatural membrane, and exhibiting other evidences of inflammation.

In the treatment, the chief object is to support a determination towards the surface, and if possible, prevent the disease being transferred to any internal organ; and in the second place, sedulously to avoid every variety of irritation. To fulfil the first indication, an emetic either of ipecacuan or its wine must be ordered, and should this medicine not act on the bowels, they must be cleared out by Submur. Hyd. and Pulv. Rhei. For drink the infant should have a diluted solution Nit. Potass. with a proportion of Vin. Antim. The external application, should be linen rags frequently immersed in warm water. All the child's drink should be given tepid. If the patient be still on the breast, its contents will constitute sufficient nourishment for him, but if he has been weaned, he should be allowed milk and water, or milk whey. Tinct. Hyosc. and the tepid bath should be ordered at bed time.

Rubeola.—This disease is produced by specific infection, and frequently rages as an epidemic during the spring season of the year, though it may be witnessed at other periods; and it rarely affects persons oftener than once in their lives. Two varieties of the disease are particularized, viz. rubeola vulgaris, and rubeola varioloides where the rush is distinct and elevated. In Scotland, the latter is styled nirles, and should be considered as a variety of small-pox; for the eruption differs materially from that of measles, and there are no catarrhal symptoms. To these Dr Willan has added a third variety, viz. rubeola nigra, where the rash becomes black, of a dark purple, or yellow; but this seems a mere symptom of debility, often produced by injudicious treatment, or the untimely exhibition of stimuli, and should be viewed in the same light as petechiæ in fever.

Measles generally begin with rigors, succeeded by increased heat, with some of the other concomitants of fever, as frequency of pulse, headache, thirst, nausea or vomiting, pain in the back, loins, and lower extremities, loss of appetite, and prostration of strength. For a few days before the fever is distinct, there is considerable sneezing; and after it is formed, slight sore throat, hoarseness, and a troublesome dry cough. In some rare instances, the catarrhal symptoms are not very obvious. With the foregoing phenomena, which continue to be aggravated for three or four days, the patient, when old enough to describe his own feelings, complains of dyspnœa; there is slight inflammation and tenderness of the eyes, swelling of their lids and of the face, with a considerable discharge of thin acrid matter from the nose. The tongue is furred, and the urine high coloured. On the third or fourth day from the commencement of the fever, the eruption is generally visible, first on the face, and successively afterwards on the lower parts of the body. At first it shows itself in minute red points, a little elevated above the surface, similar to papulæ, but without vesicular tops. The points form clusters, and shortly afterwards extensive patches. On the face, the red colour of the eruption continues, or even increases for two or three days; but from the sixth it changes to a pale or brown appearance, and is succeeded by a mealy desquamation; first on the face, and the day after on the rest of the body, with excessive itching. In many instances, young subjects are seized with inflammation of some portion of the air-passage, before the eruption is at all manifest, and if the practitioner were inactive until it did show itself, the event might be fatal. The brain in other instances might become the seat of inflammation before the development of the eruption. It has been stated, that the rash of measles is darker than that of scarlatina, but this only applies to cases attended with considerable inflammation of the air-passage. The nausea or vomiting is mitigated on the appearance of the cuticular efflorescence, which, as it recedes, is followed by an amendment in the affection of the eyes, soreness of the throat, and fever. A diarrhœa, epistaxis, or bilious vomiting are occasional attendants, the latter of which often accelerates the amendment.

Measles are frequently a mild disease, but we occasionally meet with them as a severe affection. When the rash is freely developed, continues the usual period, is unattended by much vascular excitement, derangement of the respiratory function, or of the cerebral system, no danger need be apprehended. Sometimes measles are accompanied by soft pustules which

contain a straw-coloured fluid; also by watery vesicles, and aphthæ, which may be viewed among the favonrable phenomena. A moist state of the tongue and a relaxed condition of the surface, are salutary symptoms. When on the other hand there is intolerance of light, much fever, the eruption has not been freely developed or presents a purple shade, and when with interrupted breathing, there is a disposition to drowsiness, it may be considered a severe affection. The eruption receding suddenly, may be viewed among the unfavourable symptoms. The disease is sometimes succeeded by boils resembling anthraces, livid, often deep seated, with much pain, slowly suppurating, and terminating in ulcers which are difficult to heal. At other times, the large salivary glands inflame and suppurate. In cold seasons, the most critical period is when the eruption recedes prematurely, as it is apt to be followed by some internal inflammation. In other cases, when the eruption suddenly disappears, it may be succeeded by delirium, anxiety, prostration of the vital powers, livid spots, with cold extremities, and the event is sure to be fatal. When the lungs are the seat of tubercles, these are often excited into action by measles, and the progress of phthisis hastened. Some epidemics observe a mild character throughout, while others are attended with great mortality. Seasons accompanied by frequent vicissitudes, are generally the most unfavourable for epidemics. And in most cases the disease is more severe under this than the sporadic form, more frequently fatal in town than in the country, and more so among the children of the poor, than those who are reared in spacious, well ventilated houses. When the disease proves fatal, it is generally in consequence of the inflammatory action having been transferred to some internal organ, with effusion into one of the large cavities. Some cases end in phthisis, others in chronic inflammation of the bowels; and the latter are attended by an uncontrollable diarrhœa.

In the *treatment* of measles we endeavour, *first*, to support a determination towards the surface; *secondly*, subdue excitement of internal organs; and, *thirdly*, palliate unpleasant symptoms. Frequently the disease is so mild, more especially those epidemics which arise during the summer months, that it will suffice merely to confine the patient to bed for a sufficient length of time, order a mild diet, the nourishment and drink to be given between tepid and warm, preserve the temperature of the apartment about 60, promote a free circulation of air through it, and exhibit an occasional laxative. As the attendants too frequently cannot understand why a

patient who, with the exception of the eruption, enjoys good health, should be rigidly confined, not only to a room, but even to bed, the practitioner must not forget to warn those who are interested, of the liability of opthalmia, anasarca, or some internal inflammation supervening, from premature exposure to currents of cold air.

When the eruption is sparing, vascular excitement considerable, and the encephalon, or the respiration oppressed, the action of the cutaneous vessels must be promoted by diaphoretics given alone, or in combination with aperients, when the latter are indicated. For mere infants, Vin. Antim. in repeated small doses; for older subjects, Tart. Antim. in solution, or the tepid affusion, may be ordered; and when the bowels require to be acted on, Ox. Antim. c. Phos. Calc., combined with Submur. Hyd., may be given. Whatever is allowed for drink or nourishment must be used between tepid and warm; but overheated apartments, an overload of bed-clothes, vinous and medicinal stimulants, must be interdicted. The eruption may be imperfectly developed, owing to debility, arising from the particular type of the disease: these cases are distinguished by pallid, contracted features, want of animation, general coldness, oppression, and sometimes petechiæ. This form will require the use of sack whey, warm wine, Spt. Æth. Nitros., frictions with Ol. Ammon over the whole surface, and the submersion, for two or three minutes, of the pelvic limbs up to the ilia, in water sufficiently warm to stimulate.

Sometimes the disease is preceded by convulsions, or besides these, by marked derangement of the cerebral system, as headache, drowsiness, intolerance of light, and starting during sleep. These cases require great vigilance on the part of the practitioner, the hair ought to be cut short, the head covered with cold compresses, leeches to be applied over the foramen magnum occipitis, or general blood-letting, and active purgation. Intense bronchitis, pneumonia, or pleuritis, may attend measles. Their presence, which renders the disease very formidable, must be ascertained by auscultation, in the manner to be hereafter specified in considering these affections, and treated actively by stimulating frictions over the surface, the abstraction of blood by leeches or the lancet, according to the urgency of the symptoms, and the age and vigour of the patient; or by the application of blisters to different parts of the chest. In these complications the eruption is apt to recede, and diaphoretics, stimulating frictions, and the immersion of the pelvic limbs in warm water, must be employed to recal it to the surface. Fre-

quently a diarrhœa attends from high irritation of the mucous membrane of the intestines, requiring, when there is much tormina, occasional enemata of warm water, or leeches and warm fomentations when there is much vascular excitement. The diarrhœa is on no account to be checked, but merely moderated by abstinence in liquids, and ordering rice and milk for nourishment. For the cough a mixture composed Vin. Colchic. et Vin. Antim. ana ℥ij, Syrup. Simpl. et Aq. Cinnam. ana ℥ij, cum. Sol. Mur. Morph. gt. xx, will be found useful; or it may be necessary to apply a blister on the chest. Those glandular swellings which, in strumous habits, sometimes arise after measles, may require, for their dispersion, the reiterated application of warm cataplasms, blisters, or stimulating frictions, according as they may be acute or of an indolent disposition.

Scarlatina.—We are indebted for the first description of this disease to John Coytlar, a physician of Poictiers in France, who, in 1570, wrote on the subject, under the title Epidemic Purple Contagious Fever. It often commences about the beginning of the winter months, continues to diffuse itself with great rapidity, as an epidemic, during the season, affecting children and young people, rarely those advanced in years. It is much regulated in its appearance by atmospheric vicissitudes, is thought to be eminently contagious, and is believed to affect persons but once. As in rubeola, so in this, the exciting cause exerts its influence on the mucous tissues of the air and alimentary passages, and the extent to which these are diseased, regulates the severity of the fever and other symptoms. Accordingly, where there is little affection of the air-passage, and the gastric symptoms are mild, a benign affection is developed; hence the term *scarlatina simplex.* When the mucous tissues of these organs are involved to a greater extent, the fever is more severe, the heat of surface higher, and the disease is then styled, *scarlatina anginosa.* A more violent degree of the bronchial and gastric inflammation is attended with a spare, purple, or dark-coloured eruption, and a fever of the typhoid type; and to this form, the term *scarlatina maligna* is applied.

The patient, *in the first variety*, is observed to lounge about, to be desirous of going to bed at an unaccustomed hour; and if able to describe his feelings, to complain of being weak and tired. Nausea and slight rigors, succeeded by thirst, quick pulse, and heat of skin, are almost constant precursors. The pulse is seldom strong or full, beats from 100 to 110 in a minute; there is want of uniformity in the temperature of the body, which ranges from 90 to 100, the

trunk being warm while the lower extremities are cold. From the second to the fourth day the rash declares itself, first on the face and neck by minute red points, which extend along the trunk and extremities, acquiring a brighter shade, and coalescing into extensive patches; in the interstices betwixt which, the skin is of the natural colour. These patches are redder and more numerous on the face, neck, and breast, but less regular than those of measles. The redness is often a general suffusion without distinct maculæ, and scarcely in any case is the elevation of the cuticle perceptible. In colour, the skin is far brighter at night than in the morning, especially if the patient be in bed. There is stiffness of the neck, dejection of spirits, and towards the evening of the third day, delirium; but this latter is not accompanied by other head symptoms. Some time within twenty-four hours of the cuticular affection, the lips, tongue, throat, inside of the eyelids, and lining of the nostrils, are similarly affected; and when the eyes become peculiarly red, delirium impends; but this symptom is not uncommon through the whole course of the disease, during the nocturnal exacerbation. This variety is particularly distinguished by there being little or no uneasiness of the throat.

The eruption begins to fade on the fourth or fifth day from its commencement, and with it the fever and delirium cease. The change of colour takes place first on the face, neck, and breast; and lastly, on the extremities; and is followed by desquamation of the cuticle, which is detached in extensive flakes, on the sixth or seventh day, from every part of the body, is attended by excessive itching, and may continue for thirty or forty days. The affection of the inside of the mouth and throat disappears about the same time; and the disease continues in all from four to seven days.

Young people and women are most subject to *the second variety*, sometimes it seizes the aged of both sexes, and the inflammation of the throat and the fever are more intense. It is often epidemic, preceded by the usual symptoms of a febrile paroxysm, occasionally by pallid and dejected countenance, and with stiffness of the muscles of the lower jaw. On the second day, though sometimes much earlier, the throat becomes affected, the voice is hoarse, deglutition painful, and when the tender parts are examined, the mucous tissue of the tongue and mouth as far backwards as it can be viewed, presents an elongation of its papillæ, and the same bright scarlet appearance with the external surface. The following day, the anterior arches of the palate are coated with a viscid exudation, varying in colour from white to

yellow, and also in consistence, covering the tonsils, and extending backwards to the œsophagus. In a day or two after, this crust changes to a brown, and ultimately, in some instances, to a black colour. In the fauces the swelling is less than that of common inflammatory sore throat, and when ulcers appear, they are not for the most part deep, though large: sometimes, what on a cursory examination might be considered an ulcer, is merely an exudation of lymph. The breath possesses a fœtid odour, especially when there is much gastric irritation, which appears from the second to the fourth day of the eruption. The suffusion does not show itself so early as in the first variety, often not until the third day; nor does it extend so uniformly over the body. It is developed in patches which are scattered over the neck, breast, back, loins, and extremities. Sometimes it recedes the very day of its appearance, but it may probably return the following, and continue longer than the eruption of scarlatina simplex. The inflammation of the skin is attended with tumefaction of the face and fingers; and the fever is accompanied by nausea or vomiting, diarrhœa, restlessness and delirium, with disturbed respiratory function, which is aggravated as the evening approaches. The heat of body is urgent, thirst great, with feeble, fluttering, and very quick pulse. At first the fever is highly inflammatory, and continues under this form for several days, after which the heat of surface diminishes, the pulse becomes less firm, the eruption fades, and desquamation follows; but the latter is much less regular than in scarlatina simplex. In this variety, there is sometimes pain in the ear followed by temporary deafness, and a thin fœtid discharge, which arises from the inflammation of the mouth and fauces having extended along the Eustachian tube.

One of the most dangerous diseases of children, is the *third variety*, which commences somewhat like the second, but under this form it continues only a short time, when symptoms of a most formidable character are developed. Here the eruption is tardy in its appearance; uncertain in its duration,—ceasing and returning; irregular in colour, being faint, purple, sometimes resembling cinnamon, in other cases inclined to lividity, or the surface is interspersed with petechiæ or entirely livid; and whatever be the aspect of the skin, all the visible mucous tissues, as the lining of the mouth, throat, nares, prepuce, and labia pudendi, will be similar. Sometimes these parts slough. Occasionally the eruption is so indistinct, that it is difficult indeed to say there has been any; and then the morbid phenomena consist in slight tume-

faction of the general surface, purple or livid appearance, with or without tenderness of the tongue and throat; dark sloughs of the latter; cerebral derangement; quick, feeble, indistinct pulse; with inflammation of the mucous tissue of the air and alimentary passages. The eyes are inanimate, injected, and the inner surface of their lids of the same colour as the throat; the teeth are encrusted with brown or black fur as in typhus; the breath is fœtid; in adults, there is deafness and delirium; in children restlessness, coma, noisy and laborious respiration, with acrid coryza.

In the different forms, the danger is to be estimated by the degree of encephalic, bronchial, and gastric derangement. We have little of the first two in the mild variety; but in the second there is a considerable degree, and they are present to a still greater extent in the third; wherefore scarlatina anginosa and maligna, require a *most guarded prognosis*, especially the latter, which has been known to terminate fatally in a few hours. *Autopsy* displays distinct evidences of inflammation in the organs which exhibit disturbance during life, as the fauces, air-passages, stomach, and intestines. And the brain, where it has been affected during the disease, displays congestion of its vessels, inflammation of its membranes, and effusion into its cavities.

In *the treatment* of the mild variety, nothing more is ever required than laxatives, diaphoretics, free ventilation, moderate warmth of the apartment, cleanliness, a mild spare diet, and avoiding too early exposure to a clear, brilliant light, or to cold, lest ophthalmia or dropsy supervene, a result which is common in strumous children, especially the former. Submur. Hyd., Fol. Sen., and Supertart. Potass., are the best aperients; and Vin. Antim. with Sol. Nitrat. Potass., the most eligible diaphoretics for young people.

The second variety is sometimes also so mild, as to require little more than the first; but much more frequently, all its symptoms are severe, and call for greater activity. At the commencement, an emetic of Ipecacuan is the best remedy, followed up by Calomel and Senna, alternately. When there is intense heat of surface, the vomit should be succeeded by repeated tepid affusions, which answer better after this medicine and bleeding, than the use of cold water; while it is more congenial to the feelings of the patient, and more effectual in reducing the temperature of the skin, and rendering it moist. In affections of the throat, which is often the seat of large superficial ulcers, Nitras. Argent. must be daily applied fearlessly to the sores, while leeches or venesection should be used according to the age and vigour of the patient,

and large warm poultices around the neck. When the subject is old enough to use gargles, nothing can be better at the commencement than tepid decoction of Oak Bark; and when the excitement of the fauces has somewhat subsided, Infusion of Roses. Young persons cannot use these latter remedies, but this need not be regretted, since acid drinks, such as Tamarind infusion, Lemonade, and water acidulated with Sulphuric, Nitric, or Muriatic Acid, and rendered palatable with sugar, will most effectually answer the same purpose. Another useful remedy in ulceration of the fauces is honey impregnated with Chloride of Soda. To allay cough, the most effectual remedies are, Almond Emulsion, containing some preparation of Opium, and Colchicum Wine.

Little remains to be said in the third variety. In the commencement, it requires to be closely watched, as it is then only that any good can be effected. If the heat of surface be natural, or a very little higher, affusions of water, betwixt tepid and blood heat, should be used ; or if the skin be intensely hot, cold water must be substituted. Should the chill, arising from the latter practice, be too permanent, gentle stimulants, as sack-whey, or negus must be ordered, or artificial warmth applied to different parts of the body. A most eligible remedy in this variety, when there is stamina, is the application of a few leeches along the tract of the air-passage; or when there is not sufficient vigour to support bleeding, the body should be freely rubbed with some powerful liniment, at least twice daily. Calomel, and a small proportion of Opium, must be administered to move the bowels; and mild enemata are to be in frequent use. The most powerful remedies spoken of in the second variety for the fauces, are loudly called for here, especially the Chlor. Sod. and an acetous infusion, or a tincture of Capsicum. Blisters to the external fauces I cannot recommend, from the tendency of the part to be seized with gangrene; I prefer either the repeated application of a mustard cataplasm or one of garlic, placed on the upper part of the chest. When mucus seems to be accumulating, either in the air-passage, or fauces, it must be dislodged by an emetic. The moment must be diligently watched, and instantly embraced, when it would be safe to give tonics, as Quinine or Wine, or whatever in this form, young people can be prevailed upon to use. The utmost attention must be directed to ventilation and cleanliness, which, when properly observed, will supersede the necessity of fumigation. When, from the condition of the throat, or irritation of the stomach, food cannot be taken

in its proper proportion, enemata of nourishing liquids must be ordered.

The late Dr Hahnemann was of opinion that Belladonna will act as a preventive of scarlatina, and his sentiments have been corroborated by some of his brethren in Germany; but we have not yet had an opportunity of submitting this point to the test of experiment.

Variola.—The happy discovery of the immortal Jenner renders an elaborate account of this subject unnecessary. It seems to be of Arabian origin, and to have appeared in Europe, for the first time, in 570. Small-pox may attack our race while in utero, as it has been seen in children at birth; while it has likewise appeared at the age of senility. An individual may have even as many as three attacks. It appears as an epidemic, generally in January, and continues throughout the year until the commencement of the ensuing winter. In its progress four stages may be distinctly marked; the *first* may be dated from the accession of the eruptive fever; the *second*, from the appearance of the eruption; the *third*, from the maturation of the pustules; and the *fourth*, from their desiccation. The varieties which have been particularized are numerous, but I cannot better consult the interest of my readers, than by following the familiar division, *distinct* and *confluent*. The former, in young subjects, commences like inflammatory fever, on the second day of which, one or two convulsions may occur in severe cases, followed by gastric derangement, sour breath, oppressed, hurried respiration, disturbed rest, starting and crying during sleep. From the third to the fourth day of this excitement, the eruption appears, first on the forehead, and thereafter on the face, neck, body, arms, and legs in succession, like flea bites. The fever in some cases, is so mild, that it is scarcely perceptible, while in others it is the reverse, which does not depend on the number of the pustules, as a numerous crop is sometimes attended by a milder fever than when the eruption is limited. The pustules may vary from twenty to several hundreds, or even thousands. The degree of fever and the number of pustules seem to be influenced by peculiarity of constitution, and other causes not well known, as the nature of the epidemic, local circumstances, a confined overheated atmosphere, and probably injudicious treatment, by giving stimuli at the commencement. The pustules may extend over the whole surface in twenty-four hours, and then the fever is moderated, or subsides. Suppuration commences from the fifth to the seventh day after the eruption has been seen, followed,

on the top of each pustule, by a transparent vesicle, depressed in its centre. They continue to enlarge until this change takes place, when they begin to diminish in size, and assume a white colour, are surrounded by an areola, with redness and swelling of the intervening surface. The tumefaction is more considerable on the countenance than elsewhere, from the pustules being more numerous on this part, and its greater vitality. If any be developed on the palpebræ, these appendages become so much swelled, that the light is excluded, and the eye may be seized with violent inflammation. The pustules may extend into the mouth, and along the air and alimentary passages, and be followed by cynanche, bronchitis, and diarrhœa; and in adults, by ptyalism. During the suppurative process, which terminates in five days, the fever returns, and is termed *secondary;* but sometimes this, as well as the swelling of the face, is absent. When the latter does not appear, we may then have violent delirium, even though the suppuration have proceeded regularly. Towards the eleventh day of the eruption, its desiccation commences, and the swelling of the countenance subsides. And in about a fortnight or more, the crusts are separated, which brings to view the pits, that are a principal feature of the malady, and sometimes disfigure the countenance in a fearful manner. Except that there may be a high degree of fever for three or four days at the commencement, this variety generally passes over without any unpleasant result. It would be useless to enter on the consideration of *varicella*, which every man open to conviction must admit to be but a mild variety of variola.

Confluent Small-Pox.—All its symptoms are more formidable from the first, especially the cerebral and gastric derangements, as also the affection of the skin. This variety is often ushered in by convulsions, the head is very uneasy, the nausea and vomiting obstinate, anxiety in the epigastrium extreme, respiration hurried, urine sanguineous, pustules coherent and more numerous; and after rigors, the heat of surface becomes intense. In this kind the eruption appears earlier, perhaps on the first day; frequently, however, on the second and third; but when the accompanying fever is typhoid, and the gastric disturbance severe, its development may be protracted to the fifth. The pustules are smaller, less prominent, and not so spherical as those of the distinct variety; while the fluid they contain is white, brown, or of a livid colour, and serous, unlike the thick yellow contents of the mild kind. On some parts of the surface the pustules are so numerous, that they coalesce; and this is so conspicuous on the face, that it appears as if invested by one

immense vesicle. Delirium and drowsiness are often observed during the eruption, and we may also in this stage, have difficult deglutition, hæmatemesis, hæmoptysis, and epistaxis; pneumonia, cynanche trachealis, bronchitis, and enteritis, with petechiæ in the interspaces of the pustules. Ptyalism, which is seldom absent, commences on the third day of the eruption; at first the saliva is fluid, copious, and transparent; but in time it becomes viscid, not easily ejected, and is accompanied by difficult deglutition: it ceases in a few days, and unless followed by swelling of the face, hands, and feet, or discharges by the skin and bowels, it may be succeeded by effusion into the head, chest, or abdomen. A diarrhœa also frequently accompanies the confluent variety, and is irremoveable until the acute symptoms subside. Small-pox is now rarely witnessed as an epidemic, under which type it is supposed to be highly contagious; but sporadic cases are certainly not so; and no person of any discretion now thinks of resorting to inoculation, which was first practised in Europe in 1717. The disease is most severe during the winter season, at the period of dentition, and in delicate strumous children; and the dangerous symptoms are convulsions, an early eruption, a dwarfishness, an undistended state and coalescence of the pustules, with violent headache, delirium, drowsiness, determinations to internal organs, and the absence of local swelling. Scrofula in all its forms; caries of the nasal and auricular bones; deafness, ophthalmia, and all its worst consequences, with paralysis, not unfrequently result from a severe attack of variola. In *autopsies*, the limbs are found to preserve their flexibility; and the brain, air-passages, and lungs, with the stomach and intestines, are in a state of inflammation. The cavities, not excepting the pericardium, contain effusions; and their linings are inflamed. Some portions of the brain are softened.

In the *treatment*, we are to moderate excitement, relieve determinations to internal parts, support the strength, and prevent pitting. The distinct variety is to be treated as a case of mild fever, by saline aperients and diaphoretics, free ventilation, and bland vegetable nourishment. Bloodletting is rarely required. In the confluent kind, local or general bleeding, according to the age and vigour of the patient, is often called for. If there be headache, drowsiness, oppression at the chest, or obstinate vomiting, leeches, cupping, or venesection, must first be resorted to, according to circumstances, and thereafter blisters if necessary. With these we combine the free use of warm enemata, containing Ol. Ricini. The head should be shaved, and frequently sponged

with tepid or cold water, as may be most agreeable to the sufferer, when harassed by delirium. If the diarrhœa be too free, it may be moderated by cretaceous juleps, aromatic confection, tinctures of catechu, or of cinnamon. The whole surface should be daily sponged with tepid water. Fires are to be interdicted, and the apartment freely ventilated. When typhoid symptoms appear, mild cordials, tonics, and a generous diet must be allowed. To prevent pitting, whenever itching commences, the contents of the pustules should have exit, the face covered with a pledget of simple ointment, with apertures corresponding with the eyes, nose, and mouth; and if the patient be young, the hands should be secured to obviate scratching. The application of Nit. Argent. has been recommended to effect the same object; and mercurial, instead of simple ointment, recently very highly lauded.

Cow-pox.—It would appear from what is stated on this subject in the Dict. des Scien. Méd., that its influence was known to the Hindoos, and to the South American Indians, long before it engaged the attention of our illustrious countryman Jenner. In May 1796, this individual, for the first time *intentionally*, introduced into the human system vaccine virus, taken from the cow; and to determine the genuineness of the affection produced, the person who was the subject of the experiment was also shortly thereafter inoculated, at two separate periods, with small-pox, which the system resisted. After the repetition of these experiments by Dr Jenner, the practice was gradually diffused over every civilized country. In 1798, by successfully vaccinating one human subject from another, and afterwards subjecting all those so infected to inoculation by variolous matter, it was proved that vaccination might be transferred from one person to another without resorting to the original source. From inquiry it has been ascertained that the cow, in the first instance, receives the disease from the horse's heels, which occasionally yield a discharge styled grease. In procuring the virus, however, from this source, it is proper to remember that another complaint may occur in the heels of this animal not unlike grease, but which does not produce cow-pox. The genuine matter is perfectly transparent. In the spring of the year, the disease appears on the teats of the cow, first in the form of small vesicles, which contain a limpid fluid, are of a bluish livid colour, surrounded by swelling and inflammation, becoming progressively irregular towards their margin, degenerating, when injured, into foul troublesome ulcers, and attended by fever. One animal may communicate the disorder to another, and have successive attacks

of it, but the first is the most severe; she may also infect the milkers, in whom it is developed on the digital tips, and joints; assumes nearly the same appearance; follows a similar course; and may affect them several times. A person who has once had small-pox is not exempt from vaccination, but the affection is invariably a slight one.

This disorder is so mild, that it does not in one of a thousand instances, produce any symptom to prevent its being introduced into the system, even a few days after birth; but, from the facility of exciting disturbance in young infants, vaccination, except when small-pox prevails, should be delayed until the third month; and also, until the disappearance of eruptions on the skin, or any other indisposition. At the extremity of the deltoid muscle, on the upper aspect of the arm, in male children, or immediately below the knee, towards the inner edge of the tibia, in females, are eligible points for inserting the virus. In choosing the former, the one most distant from that on which the nurse is accustomed to carry the child should be selected, lest the vesicle might be burst, and its diagnostic marks be rendered indistinct. Of all the *methods of operating* recommended, that of making, with a *blunt* pointed lancet, about six *superficial* approximate scratches in the skin, of about half an inch in length, and as many across the centre of these, is the most successful. The instrument should be charged with the lymph, while the scratches are being made; and they should be as superficial as possible, lest the effusion of blood might be too copious, and the virus be carried off. To ensure the success of the operation, the blood should be suffered to dry upon the abrasions. Some infants are very insusceptible to the action of vaccine; but when the operation fails once, an infallible method is, to have the child under vaccination, and the one about to be subjected to it, in the same apartment, that the lymph may immediately be transferred from the one to the other. It is usual to insert the matter at two different points, fully an inch apart, when both the insertions are made on the same limb. If small-pox be prevalent, and be developed in a patient at the same time with cow-pox, it is proper to remember, that in no instance has the former been aggravated by the co-existence of the latter, but, on the contrary, rendered milder. Parents should be informed, that children are not secure from an attack of variola, for at least fourteen days after inoculation by cow-pox.

The progress of the disease is as follows: from the third to the fourth day after successful vaccination, a small in-

flamed point is seen where the virus was inserted, which, on the following day, if the body be over-heated, will appear more florid, and be felt indurated. On the fifth day, a small pale vesicle forms in the centre of the inflammation, and the affection assumes the external characteristics of cow-pox. Its base is surrounded by a milky appearance. The vesicle is now turgid, with elevated margins, and a depressed centre. In the sixth and seventh days, it retains the same character, is considerably increased in size, is always slightly oval in shape, but more so when the virus is introduced by scratches, than by puncture: as its size increases, the central depression becomes more manifest, and is occupied by a small crust. The fluid of the vesicle is contained in numerous cells, and thus differs from the variolous pustule, which forms but one cavity. From the eighth day after vaccination, inflammation commences around the base of the pock, and extends in a circular form, until the ninth or tenth, when it ceases, and is from one half, to more than an inch in diameter. On the eighth, the areola, which is a distinguishing mark of the disorder, is complete; and on the tenth, the surrounding inflammation begins to fade, first in the vicinity of the pustule, and progressively thereafter from the parts exterior to it, until the whole has disappeared except a slender, but complete florid ring. The contents of the vesicle, formerly thin and transparent, now become somewhat viscid and turbid, and the whole is soon converted into a smooth shining scab, of a dark brown, or reddish colour, adhering to the part for one or more weeks, and leaving, when detached, a mark, which may continue visible for years, or for life. Though from the seventh to the eighth day be the period at which the pustule attains maturity, yet frequently this may happen on the sixth, and occasionally it is delayed to the eleventh. Its progress may be retarded by general inflammatory affections, as scarlatina. Cow-pox cannot, like variola, be propagated by exhalation, but it may by mere contact, without any operation, and even the crust softened into a pulp, is quite effectual in producing the disease. The mode of procuring the vaccine is, by making, along the margin of the pustule, by a lancet, many punctures, through which the fluid oozes in distinct drops, and is collected on small square plates of glass, on the point of a pen, or on a phial stopper that projects nearly to the bottom, and is ground into square surfaces which should be numbered. By these methods, particularly the latter, the lymph may be preserved during the summer, several weeks, and double the time in winter, provided it be kept in a cool place, and very

little in the pocket of an individual. It is scarcely necessary to recommend, that the stopper exactly fit the mouth of the phial. The genuineness of the disorder is determined, *first*, by the areola being distinct upon the eighth day; *secondly*, by revaccination at the end of the fifth, or beginning of the sixth day, and the pustules of each insertion attaining maturity at the same period; or by the system resisting the influence of variola; and, *thirdly*, by slight fever commencing when the areola is formed. In occasional instances, the local inflammation may be formidable, give rise to abscess in the corresponding axilla, or fatal erysipelas; but such effects are of very rare occurrence. Moreover, this disorder, in subjects of hereditary tendency, may lay a foundation for hydrocephalus. When the brachial inflammation runs high, to prevent the development of unpleasant effects, the patient ought to have laxatives; and warm emollient poultices should be placed on the arm. Though the influence of cow-pox be universally acknowledged, in converting a loathsome and dangerous malady into a very mild disorder, yet I presume, it is now also generally admitted, that it will not, even where it has most regularly passed through all its stages, afford, in every instance, perfect immunity from variola.

Parotis.—This is very generally produced by the irritation of dentition, and is seldom met with until this important process is well advanced. Sometimes the submaxillary gland is involved, and the swelling is coeval with the development of the molar teeth. Generally one side only, but in other cases both are affected. Though the enlargement, in most instances, acquire considerable magnitude, filling up the whole space between the angle of the lower jaw and neck, and causing even distortion of the face, yet the general irritation is not commensurate. Suppuration is far the most frequent termination of such affections, and they are got rid of much more easily and expeditiously by this process, than by attempting their repulsion. When they cannot be dispersed in an early stage, by the application of leeches, a warm emollient cataplasm should be applied. This application may discuss them, but if it do not, the matter, when superficial, ought to have exit by puncture. There need be little apprehension of deformity from cicatrice, unless the abscess has been permitted to burst. In children powerfully predisposed to struma, it is difficult either to discuss or cause these enlargements to suppurate; and when matter forms and obtains exit, whether artificially or spontaneously, the cicatrization of the wound is obstinate. Suppuration, in such cases, must, if possible, be avoided, by occasionally leeching

the swelling, by frictions with mercurial ointment, placing a mercurial plaster over it, or applying blisters. *Mumps* is another variety of parotis. It is more extensive, attended with more pain, and occasionally more fever, but less tendency to suppuration than the foregoing. The glands of both sides may be affected in quick *succession;* it is oftener seen among females than males, frequently as an epidemic, but it is not contagious. The swelling increases until the fourth day, when it subsides; and is followed by pain and slight enlargement of the testes in the male, or mammæ in the female. In young persons it rarely requires further treatment than cooling laxatives, spare diet, leeches, fomentations, and warmth.

Dropsy.—This disease, under the form of *anasarca*, *hydrothorax*, or *ascites*, occasionally appears in children suffering under, or recently recovered from scarlatina, or rubeola, in consequence of exposure to cold, whereby the exhalation from the skin is suddenly checked, the eruption prematurely repelled, and the morbid action transferred to the subcutaneous cellular tissue, or the lining of one of the larger cavities. Debility is the predisposing cause. The first of these is the most frequently met with, the others are generally consecutive to it. Anasarca, from the present causes, commences with swelling on the countenance, which rapidly increases, and extends over the rest of the body, being accompanied by oppressed frequent breathing, cough, remarkable diminution of the urine, which may or may not coagulate, and considerable acceleration of pulse. When hydrothorax and ascites are joined with anasarca, besides the symptoms common to the latter, there is livor of the cheeks and lips, inability to remain in the horizontal position, starting during sleep, fluctuation in the thorax and abdomen, bulging of the intercostal integuments in the first, or tumefaction of the abdominal parietes in the second variety of dropsy. Defective arterialization of the blood, if not the immediate cause, hurries on the fatal event. *Autopsies* discover effusions into the chest and abdomen, with coagulated lymph, hepatization of the lungs, induration of the liver and kidneys, with great accumulation of black blood in the large veins on the right side of the heart. In children several years old, and of stamina, dropsy must be *treated* by venesection, or reiterated leeching, purgatives, diuretics, diaphoretics, frictions, and warm clothing. When early practised, bleeding, in most instances, affords speedy relief. A solution of the Nitrate of Potass, with Antimonial Wine, to act upon the skin and kidneys, as it has scarcely any taste, is very eligible for children. Leeches ap-

plied over the latter organs will be found useful. The exhibition of Calomel as an alterative, is a very successful practice. Frictions, with ammoniated oil, or mercurial liniment over the surface, are serviceable. Nourishing diet and mild cordials are to be ordered when the disease begins to subside, or during its presence when protracted.

CHAPTER V.

DISEASES OF THE NERVOUS SYSTEM.

Convulsions.—Besides this title, other terms are applied to the subject, as fits and nerves. There are few infantile complaints more familiar to us than this, or more calculated to inspire parents with anxiety. It is so frequently a sympathetic affection, or a phenomenon of some other complaint, that its existence as an original disease is very generally denied. But it is not clear to me, that the occurrence of convulsions, from the opposite states of fear and anger, can be ascribed to sympathy; and there may be other cases also, which could not be explained upon this principle. *The chief predisposing causes* are the great sensibility and highly developed state of the nervous system, and of the cerebral vessels of infants and children; the rapid action of the heart and arteries: and the activity of the capillary circulation. These inherent conditions exist in different degrees, according to hereditary tendency, conformation, and the mode of rearing infants. The progeny of parents who marry at too early, or too advanced an age are remarked to be more susceptible of convulsions than the family of such as are united in the prime of life. Infants with large heads, and those affected with rachitis, are extremely subject to this affection. And it is very certain that children, delicate or robust, stimulated with rich food, are exceedingly liable to it.

The *exciting causes* are so diversified, that it would be endless to enumerate them; let it suffice to state, that any high degree of irritation may give rise to convulsions, quickly or slowly, according to the sensibility of the tissue to which it is applied, and as it acts near to, or distant from the brain. A few of the occasional causes, besides those already alluded to, may be specified by way of illustration, as superabundant and rich food, accumulation in the bowels, teething, worms, and all the acute diseases of the cutaneous tissue. Very often they arise from affections of

the head, commencing either externally or internally; of the former, we may mention the sudden repulsion of tinea, or desiccation of discharges by powerful styptic applications; also, injuries upon the cranium deranging its contents: of those which commence internally, there are none more frequent than tubercle and inflammation of the cerebrum, cerebellum, medulla spinalis, and their investing membranes. With the *proximate cause* we are as unacquainted as with that of many other affections of the nervous system. That the exciting causes give rise to irritation of the brain and spinal cord, either directly or indirectly, will be readily conceded; but that these parts are always organically affected, cannot be admitted. For, not only are convulsions excited by some causes with such rapidity, but also allayed with such celerity by some remedial steps, as to afford little time for organic lesion. Moreover, in subjects who have been cut off by these affections, too frequently no organic derangement can be discovered. They differ materially in their result; very often the child is cut off during a paroxysm; while in other instances, contrary to the opinion of M. Billard, this may be occasionally renewed for many months, without causing any injury to the cerebral system, but when the cause is by direct application to the brain, or to the spinal cord, this rarely if ever happens.

During convulsions the phenomena greatly vary. They rarely supervene at night, from the subject being less exposed to excitement; but being once established, and the cause suffered to continue, they may recur at any time. In regard to age, they may appear at birth. The fits are often so trivial, as, for a while, to pass unnoticed; and, on other occasions, so quickly developed, that there is no time to mark the antecedent symptoms; but when the infant has been previously indisposed, he is observed to be either peevish, or unusually torpid, to have intolerance of light, to squint more or less obviously, to moan, to have a pale or flushed countenance, and an alternate lividity and paleness of the lips. The characteristics of a more severe attack, however, are sooner or later ushered in; and we may find the patient with an ensanguined or suffused countenance, in a state of violent and general spasm, or in that of alternate contraction and relaxation. If affected with spasm, the head reclines between the shoulders, the spine is incurvated, the hands clenched, the eyes open and contorted, and the child is almost motionless and insensible. When spasm and relaxation alternate, the face is moist and pallid, the eye-lids are alternately opened and closed with rapidity, the

organs themselves are much distorted, their pupils unusually dilated; the jaws separated and clenched with rapidity; there is singultus, but rarely protrusion of the tongue, or foam at the mouth. The breathing is very irregular. We may find the arm and leg of the same side, or of opposite sides, convulsed, while the others are motionless. This is not an overdrawn picture, for, in severe cases, the spasms are sometimes so violent that the infant is precipitated from his cradle. These formidable appearances gradually subside, and the child either continues comatose for some time, or after repeatedly sighing, the paroxysm ceases, leaving some exhaustion; and, in a short period, the natural appearance returns. In acute diseases, we often have a quick succession of these fits, until the infant is destroyed; or, as in chronic affections, they may recur at long intervals. *The prognosis* is generally very doubtful: after protracted diseases, the exanthemata, pertussis, and even diarrhœa of recent occurrence, a guarded opinion must be offered. Where convulsions arise from injury of the spine, or of the brain, and continue long, or where drowsiness follows, or when sensibility is not restored after they have subsided, the prognosis must be unfavourable; for such cases frequently terminate by effusion into the brain. Fits arising from the irritation of dentition, are, in most instances, successfully managed. And in all cases where sensibility is perfectly restored after the paroxysm, it is a favourable omen; but since fits are easily recalled in such subjects, much attention is required in the after management. The most common *morbid appearance*, after convulsions have ceased to recur for some time, is serous effusion into the brain; and with this, there may be inflammation of its membranes, or of those covering the medulla spinalis. It is impossible, however, to concede the opinion of MM. Brachet and Billard, that this is frequently present, since occasionally not a vestige of inflammation can be discovered; nor could it be expected in some cases, owing to the rapid transition from health to dissolution.

The attendants are so panic-struck when a child is seized with convulsions, that, generally, all inquiries as to what has led to them are unavailing; wherefore to effect their removal, the practitioner must, in the first place, endeavour to determine whether any of the usual causes be concerned. The gums, therefore, must be examined; the quality and quantity of the food recently taken, ascertained; the state of the bowels determined; and we are to notice whether the infant be plethoric, or has been for some time labouring under

disease. Should the irritation of dentition be concerned, the gums are to be incised at the proper points. When the quality or quantity of the ingesta is in fault, there is not a better remedy than an Ipecacuan emetic, or one of the Sulphate of Zinc, when the case is urgent. If the bowels be loaded, enemata of the infusion of Senna, must be repeatedly exhibited. Where none of these causes can be traced, the head, and every other region, should be minutely examined, with a view to the detection of injuries, or of eruptive disease. Though convulsions, as precursors of exanthemata, are unfavourable, yet they are not always followed by unpleasant results; but the patient ought to be briskly purged, and if the fits be repeated, freely leeched on the region of the cerebellum. Where the infant is vigorous, and the case is not one for subsidiary remedies, I know of none so promptly beneficial, as opening the jugular vein: as the effusion is copious and expeditious in this way, the pulse, and the symptoms developed during the flow of blood, are to be carefully watched. In delicate infants, leeches are to be preferred; for laxatives, the most unirritating medicines are to be selected; or, if there be irritability of stomach, a succession of enemata. The general warm bath is constantly employed in these cases; but the benefit derived from so indiscriminate an application of it, as is known to be pursued in practice, is very questionable. If we would diminish cerebral irritation, the partial must be preferable to the general bath. The latter, in a state of much constitutional irritation, or after an attack of convulsions, will renew the paroxysm; wherefore, the child should not be immersed higher than the ilia, nor in water beyond blood heat in temperature. While the infant is in the bath, if there be much throbbing of the carotids, the head should occasionally be sponged with cold water. Opium is often exhibited internally, in these cases; but when there is much activity of system it is decidedly improper until blood has been freely abstracted; and immediately thereafter, a large dose of the Solution of the Muriate of Morphia will be highly useful. When the child inclines to sleep more than usual after the paroxysm, or actually becomes comatose, a blister should be placed on the back of the neck, strong liniments rubbed along the spine, and over the surface, or cataplasms of mashed garlic, or of mustard, applied to the feet.

Inward Fits.—These are another variety of convulsions. They are recognised by the palpebræ, during sleep, being partially separated, the eyes slightly contorted, the mouth presenting the appearance of a smile, sleep being easily inter-

rupted, and the breathing irregular. Any irritation of the primæ viæ may give rise to this affection, though the general belief is, that flatus in the bowels is the only cause. When the infant is noticed in this condition, and lifted from bed, the degree of drowsiness, paleness of visage, and relaxation of the limbs under which it labours, is such, as to alarm the attendants; but generally, these appearances shortly wear off and rarely terminate in actual convulsions. Inward fits are relieved, by removing from the bowels flatus and acrid fæcal matter. So long as the latter is unnatural in colour, a little mild aperient, as Magnesia, or Rhubarb, should be given once in two or three days. To cause the expulsion of flatus, a little infusion of Dill, or of Anise, containing a few drops of Tinct. Opii Camph. will be found effectual. Food tending to occasion flatulence, must be abstained from; and the nurse is to avoid such causes as might derange her milk.

Trismus Nascentium.—This is a third variety of convulsive disease. It is rarely seen in temperate climates, but frequently under the tropics. An affection is sometimes observed in the highlands of Scotland, termed by the natives, from its appearing within the first seven days, the *week disease*, which, from all the information I have been able to collect, seems to be of this nature. They ascribe it to premature exposure to cold, as it is a prevailing custom among the highlanders, to carry the infant to a distance for baptism, in a day or two after birth, at whatever season this may happen. Among negro children in the West Indies, the disease commits great ravages, from exposure to malaria during the night; and the late eminent Dr Joseph Clarke of Dublin was led to infer from observation, that a vitiated condition of the atmosphere in large hospitals greatly conduced to the disease,—an opinion satisfactorily supported by the remarkable diminution of such cases, in consequence of the regulations enforced by him respecting ventilation and cleanliness in the Dublin Lying-in Hospital, and subsequently pursued by Dr Collins in the same institution, with great advantage. Other causes are assigned, but their influence has never been clearly traced. The empyreumatic odour arising from the combustion of recent ligneous materials, in the negro huts; and among these people, also, dividing the funis with rusty scissors, have been viewed as causes; and so have, in all countries, ulceration of the umbilicus, after the separation of the cord, constipation, and exposure to cold. The influence of all these, except cold and the state of the atmosphere, seems very doubtful; for, considering their frequent application, the disease is not at all so prevalent in

any country, as might be expected. Constipation is a common cause of ordinary convulsions in young infants, but I have never seen a case of trismus that could be ascribed to it; while exposure to cold, on the contrary, is confidently alleged by the most experienced practitioners.

The symptoms of the disease are, at first, unusual fretfulness, disinclination, or strong desire for the breast, yawning, drowsiness, starting and smiling during sleep, incurvation of the spine, rigidity of its muscles, while the head is drawn backwards, and spasms of the upper extremities. At other times, the complaint not only commences in, but continues limited to the muscles of the inferior maxilla, or extends to those of the neck, while the jaws are firmly pressed together, the face swollen, purple, and exhibiting twitchings, the mouth contracted, surrounded by a livid ring, and emitting foam. The complaint is exceedingly fatal. The child rarely survives the third day; but the longer the disease is protracted, the greater the hope of recovery. In *post-mortem examinations*, Billard has found the spinous canal filled with coagulated blood; but such investigations have invariably been found very unsatisfactory. Our efforts are seldom successful in the *treatment*. Warm bath, leeches to the spine, and large doses of the Sol. Mur. Morph., should have a fair trial. Whatever be the age of the patient, it is highly necessary to remember, that the dose of opiates requires to be in a ratio with the degree of irritation, but in fact every variety of treatment has failed.

Hydrocephalus Acutus.—This malady is much more frequent than formerly; not altogether, it may be presumed, from hereditary tendency, and the mode of rearing children, but in a great measure also from irregularities on the part of the nurse, and consequent neglect of her charge. The notion of Golis, that its prevalence is owing to the more rare occurrence of eruptions on the head in the present day than formerly, is abundantly whimsical. The fact is, that where due attention to cleanliness is observed, and suitable nourishment provided, these complaints do not appear once in fifty cases, which is much seldomer than hydrocephalus. In infants and children, who are the most liable to it, there are some *predisposing causes* which are inherent, and many acquired. Of the first, the highly developed state of the brain, and of its vascular system, with constitutional weakness, may be mentioned. A predisposition to it would seem to be transferred from parent to offspring; for it is by no means uncommon for several children of the same family to become its victims. Under the second division of this order of causes, may be placed

morbid irritation of other organs, acting, as is supposed, through the nerves, as dentition, worms, and several other affections of the bowels; *secondly*, interruption to the return of the blood from the cranium, as in hooping cough, and in some chronic affections of the lungs; *thirdly*, congestion of the brain from the abrupt desiccation of long continued discharges from any part, but especially the head; *fourthly*, injuries of the cranium during parturition, or from blows and falls thereafter; and, *lastly*, the premature repulsion of skin diseases, and tubercle. In short, congestion within the cranium, in whatever way produced, may be considered a *predisposing* state. Many of the foregoing may also be viewed as *exciting causes*, more especially injuries on the head; and to these we may add frequent fits of passion, fear, exposure to cold, stimulating food, the early use of cordials, and tubercle. Debility has been considered as a principal cause, but the very rare occurrence of effusion into the brain after extreme prostration, in consequence of disease, is a sufficient refutation of this doctrine. Moreover, if the condition in question were the principal cause, it would be injudicious to have recourse to active depletion, the only treatment in the commencement by which the morbid action can be arrested. But though, in by far the greater number of cases, this will be admitted to be attended with powerful excitement on its accession, yet in occasional instances this is by no means remarkable.

It is unnecessary again to agitate the question, whether hydrocephalus be a peculiar disease, or simply the effects of inflammation, since the latter opinion is so satisfactorily supported by the result of excitement in structures resembling those which cover the brain.

The symptoms are extremely variable. In some instances, the child, from being in a state of perfect health, appears all at once unusually dull, pale, fretful, disposed to the recumbent posture, but disinclined to take nourishment, or to walk, if the latter power has been acquired; and, probably, in two days more, the disease has a rapid course, and the patient is cut off. These are most insidious cases, for the individual is in a state for which no remedy can avail, before we are aware that there is any thing the matter deserving attention. A second is, perhaps, seized with spasm merely of a *finger*, or the child cannot extend it, and in three or four days the case is fatal. In a third, violent convulsions supervene suddenly, without any warning, and the patient is either rapidly cut off, or he lives a few days longer than those who are seized in either of the preceding modes. In a

fourth instance, the primary phenomena are fretfulness, flushed countenance, alternate vomiting and purging, with drowsiness. The symptoms, in a fifth case, may be those of common fever, or of dentition, from which the patient may recover under early and judicious treatment; or the case may be more protracted than any of the preceding; this last form is the most frequent of the whole. When the disease commences in this latter mode, besides hot skin, frequent bounding pulse, and flushed countenance, there is an indifference to surrounding objects, an inanimate eye, disinclination to food and exercise, a disposition to remain in bed, and to fall asleep at some unusual time, with peevishness. Frequent starting, talking, and occasional screaming during sleep, and intolerance of light and noise, shortly succeed these symptoms. The eyes are firmly closed, and the pupils contracted; and touching the child even slightly on the hand, or coming accidentally in contact with his bed, causes him to start up with an appearance of terror, or as if something had frightened him; he is then, for the first time perhaps, seized with a convulsion, or the disease may have been ushered in by this symptom. When sufficiently old to describe his sensations, he constantly complains of headache; or the hand, from time to time, is raised towards the head, or the latter is rolled upon the pillow; and, if examined, it feels warmer than any other part of the body. In the early stages, respiration is not sensibly affected; but in the latter, it becomes stertorous. The pulse, in the onset, is seldom under 120, but it experiences several changes in the progress of the disease: in the first form, of which a brief account has been offered, the rate of vascular action at the commencement is little beyond the natural standard. Vomiting is often, though not constantly, an early symptom; and the food, or a large quantity of bile is rejected, preceded immediately, perhaps, by another convulsion or two. In most instances there is troublesome thirst, white tongue, but a variable condition of the bowels, which, in the earlier stages, are torpid, especially in old children. The disease has been divided into three stages, chiefly characterised by the degree of sensibility, and the state of the pulse; and the symptoms described in this paragraph may be considered those of *the first*, whose duration is extremely various. In some instances, the case runs its course so rapidly that the different stages cannot be defined; but, in from three to eight or ten days, we have a very different train of appearances.

In the *second stage*, all the phenomena are indicative of effusion, or of compressed brain; the child is drowsy, listless,

and occasionally moans; the face is pale, the pupil is distinctly dilated, and slightly squints; the upper lid of one or both eyes is paralytic, and drops over two thirds of the organ; the pain of head is diminished, but the tossing and screaming continue; there is an occasional deep sigh; and the delirium is aggravated; the temperature of the body, and the rate of pulsation, are below the natural standard; and the appetite is much increased. Occasionally, the child is sensible to within a short period of dissolution; or if delirium have been present, it may subside for a short time, and such a degree of amendment may appear in the condition of the patient, as shall deceive the inexperienced. This stage seldom continues beyond two or three days.

The *third stage* is characterised by symptoms of increased pressure upon the brain, indicated by great frequency of pulse, which is weak, and ranges from 150 to 160; occasional general convulsions, or spasms, or convulsive movements of a corresponding arm and leg, or of opposite extremities. The teguments covering the anterior fontanelle, if this be still open, become conical, and the sutures of the cranium, in young children, yield; but it is very rare to find the head distinctly increased in size. There is greater squinting, or vision is entirely lost, the cheeks are alternately pale or flushed, the face imbued with perspiration, the urine and fæces passed involuntarily, or the former retained, the breathing irregular until toward the end of this stage, when it becomes stertorous; ard the patient dies convulsed, or from debility, after a struggle, varying in duration from three to seven days.

When the disease is purely the result of venous congestion, arising probably from exposure to cold, we have oppressed brain, cold, pale skin, dilated pupil, weak pulse, and quick, feeble respiration, with convulsions at uncertain periods; and the same symptoms may be produced by an overloaded stomach. There is another variety of this affection, termed *subacute*, arising from irritation of some distant organ, as that of the gums from teething, or of the stomach, liver, intestines, or mesentery, from some chronic disease. It is characterised by the functions of the brain being at no time so much disturbed, nor the pulse so frequent; neither is the heat of skin at any period so intense: of this nature is hydrocephalus, when arising from tubercle. We have no special symptom, by which we can determine the presence of tubercle in the brain, but if a child of scrofulous diathesis, affected with strumous swellings, phthisis, or tabes mesenterica, becomes attacked with hydrocephalus, we have a strong pre-

sumption that it has been caused by inflammation, induced by the presence of tubercle. *The diagnosis*, at the commencement, in young children, between hydrocephalus and common fever, arising from a variety of causes, more especially dentition, worms, and disordered stomach and bowels, is extremely difficult in all, or even unattainable in some instances, whatever may be said to the contrary. But it would seem most prudent, in every case which exhibits great cerebral excitement, to treat it as one of inflammation of the brain, since, though not actually so at the onset, it might by inefficient treatment, ultimately terminate in this way. Hydrocephalus, however, differs in a most remarkable manner from the diseases which resemble it, by the firmly closed eyelids, the reiterated convulsions, drowsiness, sudden screaming, vomiting, appearance of terror on awakening from sleep, intense heat of the head, deep drawn sigh, fixed eye, and squinting. *In regard to the prognosis*, no other than a decidedly unfavourable one can be offered, after symptoms of effusion have appeared, for the texture of the brain must now be so much injured, that recovery could not be expected. If any good can be effected, it must be in the first stage, when unquestionably many have been permanently relieved. When the case is not speedily fatal, it may end in the chronic variety, and life be indefinitely protracted. *In autopsies* the appearances vary. The membranes may be found inflamed only to a limited extent, or extensively incrassated, and covered with a small, or a large quantity of coagulated lymph. On the surface of the brain, and betwixt its convolutions, we often find, especially when the aqueous effusion is limited, a quantity of matter very much resembling white currant jelly. In cases which have been rapidly fatal, this has been the only appearance. The vessels of the cerebrum are generally in a state of great turgescence. There is the greatest difference in the quantity of water; sometimes it is a mere oozing, especially where the disease has had a rapid course; while, in other instances, it has amounted to three or four ounces; and it is perfectly colourless. The lateral ventricles are generally its seat; but occasionally it is found between the cranium and the membranes of the brain, or betwixt the two latter. In some cases the integuments covering the scalp are affected with dropsy, which has been known to communicate with the effusion within the cranium. As observed by Dr Abercrombie, in his valuable researches on the pathology of the brain, tubercle of that organ gives rise to most extensive softening, and I lately examined the brain of a child, of which nearly one half of the right hemisphere

was reduced to a pulp; and on placing a portion of this matter below the microscope, I found it to present the appearances characteristic of tubercle and inflammatory softening: the patient was also affected with tabes mesenterica.

The *treatment* will depend on the stage in which we are called; and in the first, we place our reliance chiefly on the abstraction of blood, which in children may be obtained from one of three points, viz. the arm, jugular vein, or the back of the neck. After five years of age, or even earlier, the first point should be chosen; but betwixt this and one year, I would prefer the external jugular. By selecting either of these, the quantity required can be procured in a few minutes, and we thus save the child the injurious irritation arising from the protracted operation of leeches. Blood is to be abstracted until we make a proper impression on the system; and as the disease is a most destructive one, it is necessary to act with decision: if the age of the child be under a year, leeches applied behind the angles of the lower maxilla, or on the back of the neck, is certainly a preferable mode. We avoid, as far as our judgment can guide us, unnecessarily reducing the system; but in a favourable case, it is better to go a little too far, than inefficiently to wield the only remedy which can save the patient. And as the malady has occasionally been removed, under circumstances which precluded all hope, we are not to relinquish active treatment so long as there is any prospect of being useful. Another mode of procuring blood is by cupping.

Purgatives come next in order, and they should be pushed vigorously. The most eligible, since it can be given in small doses, and as it is an object not to increase gastric irritation, is Calomel; or if the stomach reject every thing, enemata of the infusion of Senna will act powerfully on the bowels; but the moment anything can be retained, the Submur. Hyd. in small doses daily, should be commenced; and to promote its operation, followed up by Castor Oil, and enemata of plain warm water. This plan only requires a fair trial to inspire confidence. The application of cold to the head, when unusually warm, is highly proper; the hair must first be cut close, and a nurse be made to take her station by the bedside, to apply to the head two or three folds of linen wrung out of cold water; and they are to be changed before their temperature can equal that of the skin. *After* the high fever has been sensibly subdued, blisters on the back of the neck are most beneficial remedies; and to promote the object with which they are applied, some stimulating rubefacient should be used morning and evening, to the pelvic limbs.

Purgatives, blisters, and rubefacients, are our principal agents in the second stage; and in young subjects, sack whey; or in those who are older, a little wine is to be allowed to support the system. Puncturing the anterior fontanelle, to withdraw the water, has been proposed, but it is very unlikely, from the injury that the brain must suffer, that this measure can ever be successful; for there is a material difference betwixt the condition of the organ in acute, and chronic hydrocephalus, in which it has, in a few instances, succeeded. For tubercular disease of the brain Prof. Barez of Berlin used to recommend doses of Arnica. Mont., but I never saw any benefit result from it.

Chorea.—This disease, thongh occasionally witnessed in adults, is principally confined to young persons. I have seen it in children under five years of age, and in others who had nearly attained puberty; more frequently in boys than girls; and as often in stout, as in thin children. Its prevalence in young persons is explained upon the principle of the greater susceptibility of their nervous system, which would seem the chief *predisposing state.* The *exciting causes* are numerous, as surfeiting, improper nourishment, accumulations in the primæ viæ, worms, the sudden repulsion of cutaneous eruption, the injudicious administration of mercury, injuries on the head, and terror. Fits of passion in young females of acute feelings, have sometimes led to the disease. It seems to consist in irritation of the nervous system, more especially that portion of it distributed on the digestive apparatus,—an opinion rather deduced from the effect of remedies, than dissections.

At first, the *symptoms* require strict attention for their detection; as, to a non-medical observer, they would seem rather a disposition to playfulness, than disease; for the patient, instead of lifting the leg properly, drags it after him; the left is oftener affected than the right; and soon afterwards, the corresponding upper limb is similarly seized. The muscles of locomotion are always the first to be attacked, and those of the other organs are affected in succession. As the disease advances, the head, when involved, is inclined to either side, or forwards, but rarely backwards; and some times it is shaken, as if the individual were in the act of menacing some one. The muscles of the face, tongue, and throat, are affected, whereby, when the patient attempts to speak, the countenance becomes contorted, and utterance is much interrupted. When the trunk is involved, it is thrown into the most extraordinary attitudes; or if the muscles of the

arm feel its influence, a glass or cup containing liquid, cannot be carried to the mouth without losing half its contents. The spasm sometimes suddenly quits the limb affected, to attack its opponent; and, what is singular, the complaint is entirely absent at night. There is an appearance of dulness and languor in the countenance; the appetite may either be impaired or voracious; and from the bowels being generally constipated, the abdomen feels tumid and hard. *In the diagnosis*, chorea must be distinguished from paralysis and convulsions. There is no loss of motion, or inability to move the limb in this affection, the reverse of which happens in paralysis. In convulsions, there is total loss of consciousness and volition, which is never the case in chorea. The disease is seldom protracted beyond one or two months; but in a few instances, it has continued from childhood to old age. Except when produced by terror, or lesion of the brain, a favourable *prognosis* may be delivered. When it has continued long, the intellect is apt to be impaired, though there are cases where this has not happened.

The treatment chiefly consists in the persevering use of purgatives and tonics. Of the former, Senna is the most eligible for very young people; but for those who are older, Aloes, Jalap, Scammony, and Calomel, may be ordered alternately; and the last of these, where worms are suspected, should be frequently combined with the others. When the disease is fully formed, before the case is subjected to regular medical treatment, it is often obstinate; but though the amendment be not apparent, we must not lose hope. There is no doubt that aperients deserve the high opinion entertained of them by some eminent authorities, but they are not to be considered infallible. They must be persevered in, until the excreta have assumed a healthy aspect, and continued for some time thereafter. The object is not merely to get rid of acrid fæces, and keep the bowels free, but to excite the chylopoietic viscera to greater activity. The Sulph. Potass. c. Sulph. and the Sulphureous Mineral Springs, are very useful. With these agents, aromatic bitters and tonics should be combined, especially when the purgative plan is inactive. To children, the Ox. Zinc., or Sulph. Quin. in pills, or infused in wine, will be found very beneficial; and for older patients, Iron, Copper, and Arsenic, cautiously administered, have proved useful. A *country* residence, and mild nutritious diet, are to be recommended. When the patient is sent out to walk, he should be accompanied by some one to caution him against giving way to the fit; and whatever is apt to inspire

fear is to be avoided; therefore, instead of the cold bath, during the proper season, simply sponging the surface with cold water, will be preferable.

Paralysis.—This may attack either the thoracic or pelvic limbs; and mere infants are not so liable to it as those from eighteen months to three years old. It may be noticed after a severe attack of fever from dentition, disordered bowels, skin disease, meningitis, injuries on the spine, or exposure to cold; but sometimes it cannot be accounted for. The presence of paralysis may be suspected where there is no appearance of local injury, and where the subject has relinquished movement with the limbs; or walking after that power has been acquired, where he is observed to drag either limb instead of lifting it as formerly; where one of them is much atrophied, and the other plump; or where he does not attempt to walk, though past the age at which this is usually commenced. It may be presumed that this state is connected with some lesion of the brain or nerves; but since, fortunately, few cases prove fatal, the nature of the morbid state must be pure conjecture. The disease is removed by the regular use of laxatives, warm clothing, tepid bath, frictions with some stimulating liniment, tonics, and country air. When these remedies do not succeed, blisters, strychnine, and electricity should be tried. Where all power in the lower limbs is lost, a moxa may be applied on the spine, as in such cases, this column or the medulla is often in fault.

CHAPTER VI.

DISEASES OF THE RESPIRATORY FUNCTION.

Pertussis.—This is a disease which makes frequent visits as an epidemic, in all climates, and in all seasons of the year, and attacks the same individual but once in his lifetime. No age is exempt from it; infants a few weeks old may be affected; and Heberden saw a woman of seventy, and a man of eighty, labouring under it; but it is chiefly met with in young people. Among adults, females and persons of delicate habit are oftenest seized with it, from which it may be inferred, that its great prevalence among children is owing to the delicacy of their tissues. *The causes* are very obscure; as when epidemic influence is not concerned, we are frequently unable to account for it. In many cases it would seem to be produced by exposure to cold, and by causes irritating

the air-tube or alimentary canal. I have known well-marked symptoms of pertussis induced by snuff being put into the mouth of a young person while asleep, and some of it being drawn into the trachea during inspiration. It is thought to be infectious, from the circumstance of many persons being seized about the same time; but this simply shows its epidemic origin, of which there cannot be a doubt. The inhalation of the ova of an insect was also, at one time, supposed, to give rise to it; but such an opinion is not worth refutation. From several circumstances, it might be inferred, that there is something of a specific nature in the morbid action which constitutes pertussis; as its occurrence but once in the same person, and our inability to arrest its progress by remedies, or to do more than mitigate the symptoms.

Its phenomena are very uniform: for a few days at first it cannot be distinguished from a severe catarrh; the cough is sonorous with very little mucus; there are frequent rigors with considerable fever; an inclination to vomit; greater disposition to sleep than usual; impaired appetite; torpid bowels; as yet, the kink or hoop, which is the chief feature of the disease, is not formed. In from ten to fourteen days, the patient, instead of being occasionally cold, feels constantly hot; the hoop is progressively formed; the cough gradually assumes more the character of a spasmodic effort, and recurs in paroxysms, which are more severe at night than during the day. The patient has a clear perception of the approach of the fit, and prepares for a violent struggle; he clings for support to any thing that is near him,—his mother, chair, or bed-post; and after a severe attack of cough, panting for breath in a painful manner for some time, and rejecting the contents of the stomach, with mucus from the air-passage, he rapidly regains his usual cheerfulness, and resumes his playful occupation, as if nothing had occurred to him. During the fits, the mucus, at first scanty, becomes more copious; the eyes are prominent; the countenance swollen and livid; and the vessels of the neck turgid. This may be considered a description of the severest form of the disease; but frequently we meet with examples, especially during warm weather, which, from their mildness, can scarcely be distinguished from a common catarrh. In ordinary cases, the fits recur once in two or three hours; when urgent, every hour. The duration of the disease is regulated by the seve rity of the symptoms; when they are mild, the complaint may not continue more than three weeks; but when severe, as many months. The fever is of the inflammatory kind, but sometimes even this is so slight, that it is not at all obvious. A

copious secretion of mucus marks the subsidence of the complaint, and mitigates all the urgent symptoms. In the *diagnosis*, it is to be remembered, that there is no disease in children that can be confounded with this; and from asthma, the only affection in adults which it resembles, it can be distinguished by its being constantly accompanied by fever, and the fits being of frequent occurrence. The *prognosis* must be very guarded, when convulsions have appeared: when the subject is young; when the fits are succeeded by drowsiness; when there is severe fever; when the patient is suffering from some other complaint, as dentition or the exanthemata; and when there is bloody mucous expectoration; it is always more severe on children residing in a crowded city, than such as are reared in the country. The favourable circumstances are, warm weather; slight fever; fits mild and recurring rarely; moist skin; copious vomiting; and free discharges of urine. Its most common *termination* is, inflammation of some structure in the chest; but in habits predisposed it sometimes gives rise to pulmonary tubercles, meningitis, hydrocephalus, enteritis, and tabes mesenterica. *The appearances on dissection*, with exception of distinct evidences of congestion, or actual inflammation, and great accumulation of mucus in the bronchia, are quite uncertain. According to Lænnec the extremities of the ramifications of the bronchiæ are much dilated, and this remark has been corroborated by Billard, who also speaks of inflammation of their neighbouring lymphatic ganglions; we sometimes find the lungs hepatised.

We have two obvious indications *in the treatment; first*, to alleviate the distressing symptoms; and, *secondly*, to support the system. One of the most harassing complaints is the cough, and when there is no spontaneous vomiting, an emetic should be ordered every alternate day, or occasionally when the contents of the stomach are rejected without medicine, as the best remedy we possess. For young children, the wine of Ipecacuan; or for those who are older, the powder of this drug, is the most eligible. The frequent use of laxatives is highly proper; and so also are frictions with powerfully stimulating liniments, on all parts of the chest. Wine or troches of Ipecacuan may be allowed at all times in such quantities as shall not excite vomiting oftener than what has been already specified. Should these be disrelished, a most useful formula is a solution of the Nitrate of Potass, with a proportion of Antimonial Wine, and of the Tincture of Hyoscyamus, more especially when there is much fever. The tepid bath should be ordered morning

and evening, and at the latter period, an anodyne. The Sulph. Alum., administered in doses of 5 grs. three times daily, has been found of much use in gradually modifying the violence of the cough, and shortening the duration of the disease. Where there is fever, though unaccompanied even by dyspnœa, but more especially when this latter symptom is present, whether the patient be plethoric or not, leeches are to be applied to the neck or chest, according to circumstances. When the patient is disposed to be drowsy after the fit, the head must be carefully watched, a few leeches are to be applied on the neck, and the bowels frequently opened by some active medicine. Should the difficult breathing not be relieved by this measure, blisters on the sides, the pelvic limbs occasionally immersed in warm water, and the application of garlic to the feet are to be carefully tried. In protracted cases, the limbs are apt to become œdematous, and a very eligible medicine for young persons is Nitras. Potass. in solution; the Acet. Scil., Tinct. Digit., and Spt. Æther. Nitr., in combination. To support the system, the sufferer should be ordered a country residence, which has an incredible influence in mitigating the disease, even in the early stage. In suitable weather, the child should be frequently in the open air. After it has become convalescent, the chest should be encased in a Burgundy Pitch plaster, flannels worn next the skin, and the diet should consist chiefly of milk.

Cynanche Laryngea.—This affection generally attacks plethoric, robust children, in preference to subjects of an opposite habit; but adults are the most liable to it. It may be a consequence of common coryza, or the first seat of attack may be the larynx. Cold, which may be applied in a variety of ways, is, perhaps, the only exciting cause in children. It is accompanied with an abundant secretion of clear ropy mucus, which becomes thick, and acquires a yellow colour. When the throat is examined, an unusual redness may be perceived extending from the fauces to the larynx. Respiration is interrupted, and characterized by a sound as if the patient breathed through a narrow tube; and by closely listening, a flapping of the epiglottis will be perceived, which is a most unfavourable symptom. In most cases, the child sucks greedily, though it be soon rejected; but in other respects, vomiting is not a frequent symptom. When the complaint has made further progress, the voice, from being audible, is more like a whisper, and never loud, as in croup; and the sufferer cannot cough out freely; the attempt ends in a suffocating sound. The larynx cannot easily bear pres-

sure; respiration becomes hurried, and ultimately laborious; the pulse, from the first accelerated, gradually increases in rapidity, and becomes small. At last, the countenance exhibits a pallid livor, which is particularly conspicuous on the alæ nasi, and lips. The disease extends to the continuation of the air-passage, and the subject dies asphyxiated, either in consequence of the passage being rendered impervious by false membrane, or blocked up by mucus. This is a most dangerous affection in young or old; it is rapid in its progress, and no effectual relief can be afforded, except when attacked early. In young subjects, the larynx is so narrow, that tumefaction of its lining must soon prove fatal. *On dissection*, we may find the whole inner surface of the air-passage varying in colour from intense redness to a violet shade, softened, covered with tenacious mucus, or lymph nearly membranous. The back of the tongue may be bright red, and the epiglottis œdematous. Sometimes different portions of the intestines show unequivocal signs of inflammation.

Cynanche Trachealis.—This complaint is very prevalent among children; it prefers the more robust, and may attack them at any season of the year, but chiefly in spring and autumn. It is often observed during the prevalence of easterly winds; among those residing in the vicinity of flat swampy grounds; and such as have had one attack are liable, either shortly afterwards, or after the lapse of months, to be again seized with it. Children on the breast are not so disposed to it as those who are older. The same causes produce this, as the last affection. It may be impending for a day or two, in the form of a catarrh, without any suspicious symptom; and in some instances, it is an extension of the last affection. It begins with a rigor, and this is followed by a considerable degree of fever; a loud shrill sound, after the trachea is actually involved, so peculiar, that a person who has before heard it would at once recognise it, even at a distance; a red, watery appearance of the eye; a crowing noise on coughing; laborious respiration; occasionally, difficult deglutition; increased heat of surface. At last, the child becomes drowsy, the countenance and lips are swelled, and affected with pallid livor: sometimes there is occasional vomiting, during which the patient rejects portions of the false membrane that forms in the air-passage. This production is a lymph exudation, which varies in density according to the duration of the disease: it is firmer, and more completely formed in the upper than the lower part of the tube, where it is generally gelatinous. Croup terminates in the

same manner as laryngitis. Every one is aware of its dangerous and untractable nature, unless attacked very early, when it may in very many cases be subdued. A second attack, shortly after the first, when the child is early seen, is more easily arrested than the primary one. Its duration is very uncertain, and depends on the intensity of the inflammatory action; in severe cases, the patient may be cut off in less than two days. The morbid appearances differ somewhat from those of the subject last considered, more especially in protracted cases, where the lungs become inflamed.

We may consider under one head, *the treatment* of these affections. No remedy seems so eligible as blood-letting; it should take the precedence of every other; and when efficiently practised in an early stage, its effects are almost incredible. *In the first place*, where there is stamina, the external jugular vein should be opened; for in this way, as much blood will be obtained in three or four minutes, as by the application of what might be considered the proper number of leeches, in twice as many hours, whereby time is saved at the most important period of the disease; and moreover, we can form a proper estimate of the quantity abstracted, which cannot be done when leeches are used. So efficient is this remedy, that frequently I have seen the patient much relieved by it, before I had been able to quit the house. It should be followed up by the Wine of Colchicum, until a pallid countenance and yawning give notice of nausea. This plan is preferable to emetics, so eminently useful under similar circumstances in adults, but which, in cases where blood has been abstracted from the jugular vein, might cause this vessel to re-open. The Colchicum should be recommended whenever the disease shows a tendency to return. In whatever way it is to be explained, I feel persuaded, that bleeding by leeches, or even from the arm, in young persons at least, will not bear comparison with this mode. *Secondly*, if the patient be sufficiently old to use gargles, warm water, or the inhalation of its steam, should be frequently employed; or, if the party be a mere child, it must be encouraged to sip often some bland warm fluid. *Thirdly*, it will be found of immense advantage to excite perspiration; wherefore immersion in tepid water, as far as *the ilia*, should be occasionally practised, in conjunction with small doses of Ipecacuan Wine. *Fourthly*, the bowels are to be kept free by Castor Oil, and laxative enemata. *Fifthly*, the apartment must not be overheated, lest artificial fever, and an aggravation of the disease might be occasioned. And, *lastly*, nothing stronger than tepid milk whey, milk and water, arrow root, and such

substances, are to be allowed for nourishment. When, either in laryngitis, or in croup, the case will not admit of the abstraction of blood from the system, leeches, emetics, blisters, purgatives, and the partial warm bath, are to be employed; Sulph. Cupri in 5 gr. doses has been highly lauded as an emetic in croup, as it is supposed that the violence of its action aids materially in throwing off the false membrane from the trachea, and thus preventing suffocation; and to soothe the cough, the Sedative Solution of Opium will be found the most useful of all the preparations of this drug. In regard to Calomel, of which much has been said, the author never found it more beneficial than other purgatives; and in a disease so rapidly destructive to life, a most obvious objection to its use, to the exclusion of other powerful means, is, the length of time which it requires to produce its supposed salutary action.

Where the foregoing means have failed, it has long been proposed to afford relief by the operations of laryngotomy and tracheotomy, which, though from time to time performed, have rarely been successful. At this, however, we need be little surprised, since they are seldom if ever contemplated, until all the ordinary remedies have been used; and ere this, the disease may have extended to the lower part of the trachea, and seized even the lungs themselves. But as the latter operation has, in a few instances, afforded permanent relief* where such an event was altogether unlooked for; and as, if the result should not be successful, the expedient is so extremely simple, that it could not, when dexterously performed, render the situation of the patient more critical, there can be no real objection to the practice.

Spasmodic Croup.—This variety is most apt to attack children at the period of cutting their deciduous teeth, young females at the age of puberty, and such as are either pregnant or nursing, for the first time. Generally it is not connected with inflammation; though, doubtless, if allowed to continue, this may supervene. Children have frequent paroxysms of it; and females are often unexpectedly seized with it for many nights in succession, in consequence of mental anxiety or vexation. From this it would seem, under particular circumstances, to be excited by the influence of the cerebro-spinal axis, acting through the medium of the nerves which are distributed on the larynx; but the irritation of dentition, or that arising from derangement of the

* Med.-Chir. Transac. Lond. vols. iii. and vi. Successful cases by Dr Andree in 1782, and Mr Chevalier in 1814.

digestive canal, is by far the most frequent cause. *Its symptoms* are a hard barking cough, with very little mucus; a wheezing sound, difficult respiration, with paroxysms of threatened suffocation, occasional spasms of a limb, or of the fingers or toes, and even opisthotonos. From the acute variety it may be distinguished by the absence of fever, the suddenness of the attack, the scantiness of the mucus, and the perfect restoration to health after the fit has subsided. The principal danger here, is the induction of the acute variety, which, in children especially, is extremely apt to happen; but such a conversion I have never witnessed in females; and when it happens in children, it is not by any means so difficult of removal as a case which has originally been acute.

Sir Henry Marsh, Ley, and others, have represented the disease as occurring only in children of a strumous diathesis, and the latter has adopted the opinion of Peter Frank, that the affection depended upon enlargement of the thymus and bronchial glands, compressing, or stretching the pneumogastric nerves, and thereby inducing a spasmodic affection of the larynx. Later investigations have by no means confirmed this statement, for in many cases which have been carefully inspected, no such enlargement was found, the only morbid appearance being congestion or inflammation of the intestinal canal, or brain and spinal cord, and also invaginations of the digestive tube.

In the *treatment* of cases arising from the irritation of dentition, little more is ever required than scarifying the gums, clothing the child warmly, and regulating the bowels and the diet. Where the complaint is apt to be readily excited by trifling causes, an Opium Plaster, worn round the neck, is useful. When we are certain that the bowels are free, a large dose of some antispasmodic on the accession of the fit, generally subdues it. Emetics are highly recommended, but I never found them necessary. Frictions with antispasmodics, and blisters, are often useful. Sometimes, after several attacks of this complaint, of the acute variety, or of bronchitis, a hoarseness, or a wheezing continues; or it may have been present from birth, and under these circumstances, flannel clothing, and encasing the chest in a Burgundy pitch plaster, will be found highly useful. For young females who may be troubled with this affection, Tinct. Valer. Vol., Aq. Carb. Ammon., or Camphor, are efficient remedies; or when they are plethoric, moderate blood-letting, and free purgation are proper; but the repetition of venesection must, if possible, be avoided, as it would induce a state favourable to

the frequent recurrence of the disease. In all subjects, a *country* residence is very conducive to its removal.

Bronchitis.—This disease may appear either as a primary affection from exposure to cold, or as consecutive to croup, pneumonia, the acute diseases of the skin, extensive scalds, or burns; and sometimes it reigns as an endemic, or an epidemic. Very young subjects, from their restlessness, are not the most proper for the application of the stethoscope; but a practised auscultator, by listening more especially during the deep inspiration that follows the cry of the child, will at once recognise the affection, by the sonorous, sibilous, or mucous râle according to the stage of the disease. Children are particularly liable to bronchitis, from their general delicacy, and the sympathy which exists betwixt the skin and the mucous tissues. *Its symptoms* are an accelerated state of the breathing, a rattling or gurgling noise in the chest, produced by the air traversing the mucus accumulated in the bronchial tubes; cough frequently supervening in fits, with abundant mucous expectoration, which, in the milder examples of the the disease, is transparent and frothy, but which, in the more urgent, constitutes broad yellow patches of the consistence of mucilage; a purple colour of the lips and cheeks, from insufficient arterialization of the blood; prostration of strength; increased heat; rather frequent but soft pulse; headache, vomiting, and giddiness occasionally, but these are inconstant; and very little pain during inspiration. After acute diseases of the skin, it assumes a chronic form, in which the appetite and bowels are variable; there is general wasting, nocturnal fever, and sweats. *The diagnosis* betwixt this and other diseases of the chest, is a point of the first moment to be clearly known, since the treatment must be widely different. Here we have a loose cough, while in laryngitis it is attended with a low suffocating sound; in croup, clangous; in pneumonia, harsh and shrill; and in pleuritis, hard and short. The expectoration too is different; here it is loose and copious; but in inflammation of the substance of the lung, it is scanty, tenacious, and of a rusty colour; and in that of the pleura, there is little if any secretion; or if there be, it is transparent and frothy. Another peculiarity of bronchitis, too obvious to be overlooked, is the almost total absence of pain on taking a full inspiration. *The prognosis* in cases connected with inflammation of other organs, where there is general prostration, much fever, and a profuse secretion of mucus, should be very guarded. When bronchitis is not connected with any other disease, has been early and judiciously treated, and the patient has strength, we may de-

liver a more favourable opinion. *In post-mortem examinations*, we find the inner surface of the bronchiæ filled with mucus, and their lining membrane extremely vascular. When their contents have been wiped off, they appear, in most cases, of a dark purple colour, but gradually become red. The lungs are much engorged and œdematous; and if incised, and their substance be pressed, a large quantity of sero-purulent fluid exudes. On the right side of the heart, the vessels are much congested, and the blood sometimes in a fluid state: the brain is at times in the same condition, but in other instances, it is perfectly sound. And occasionally, the mucous coat of the intestines does not escape.

Though this be an inflammatory affection, yet, in *its treatment*, there is none in which the abstraction of blood requires greater discrimination; for, were it carried the length of causing debility, the patient would be incapable of the effort required for expectoration, and the quantity of mucus thrown out might soon exceed that which could be expectorated, so that the individual would be cut off by asphyxia. If there be much heat of surface, with a full expanded pulse, or a contracted resisting one, a *moderate* bleeding, either by leeches or venesection, according to the age of the subject, should be premised. But if the state of the pulse be the reverse of these conditions, we must, in children, abstain from bleeding in every shape, and resort to frictions with some powerful liniment over the whole chest, and garlic to the feet. Should these means not appear to be relieving the patient, blisters must be tried. A determination is to be supported to the surface, by warm diluents, and saline diaphoretics; and the bowels are to be kept free, by mild laxatives; but we are carefully to avoid producing nausea or vomiting. The attendants are to be warned against overheating the patient by blankets, or large fires. When there is much debility, the mucus not expectorated in a ratio with its formation, drowsiness from imperfect arterialization, and congestion in the head, the patient must be allowed mild stimuli, tonics, and cordials. Chronic cases are very untractable. The usual remedies are frictions with Tart. Antimon. or Iodine, blended with lard; blisters, tepid bath, country air, milk and farinaceous diet.

Pneumonia and Pleuritis.—These diseases are sometimes present at birth. Both may be met with separately, independently of any other affection, or in combination. Pneumonia may be a sequela of bronchitis, or of pleuritis. In young infants, the lungs are *predisposed* to inflammation from the volume of blood which enters them after birth; and

there is another reason why these organs, and also the pleura, should be very liable to this morbid action, especially from any cause which may check the circulation toward the surface, viz. the very free anastomosis betwixt the vessels of the external and internal surfaces of the chest. Cold, which may be applied in such a variety of ways, is the most frequent *exciting cause*. The present complaints are also often met with under a chronic form, after skin diseases. We cannot easily, in very young subjects, distinguish pneumonia from pleuritis: *the symptoms* of both are constant fretfulness, hurried short breathing, and cough, with very little expectoration; the points in which they principally differ, are, that in the latter, there is greater animation, or flushing of the countenance; greater heat of surface; that the tongue and urine are more loaded; the pulse more frequent and resisting; the child cries after the cough, as the pain in pleurisy is much more acute; in both, however, there may be a diarrhœa. In pneumonia, the face is pallid, the body very little warmer than natural, the cough more troublesome, and the extremities, especially the pelvic, are cold, corrugated, and exsanguined. *The diagnosis* betwixt the different affections discussed in this chapter, is laid down in *bronchitis*. *Our prognosis* in these complaints, should be more guarded in children than in adults, for in the former they are more rapid in their progress. They may terminate in adhesions betwixt the pulmonic and costal pleura, effusion, abscess, and in a chronic state. *On dissection*, besides the morbid conditions just particularized, we may discover hepatization of either lung, a greenish gelatinous effusion in the sacs of the pleura, and more or less mucus in the bronchiæ; occasionally *ramollissement* of the stomach, and of some portions of the intestines; and the lungs so much hepatized, that they instantly sink to the bottom of a vessel of water.

We must be prompt and decided in the *treatment*. Leeches are to be applied to the chest in adequate numbers, or blood taken from the arm, according to the age of the subject; and thereafter, to calm irritation, we order a powerful anodyne. It will be of the first consequence to determine to the skin; wherefore, immersion of the lower part of the body, as far as the ilia, in warm water, must be occasionally practised; and solutions Nitrat. Potas. with Vin. Ipecac. given to occasion diaphoresis. The bleeding should be followed up by the use of Colchicum Wine, and frictions with some powerful liniment over the chest, morning and evening. When relief is not afforded by the foregoing measures, recourse must be had to blisters; but

they should not, if possible, be resorted to, more particularly in pleuritis, until the high temperature has been moderated Mild purgatives are occasionally to be exhibited. The strictest antiphlogistic regimen is to be observed, during the acute stage. In chronic cases, the same remedies are to be used, as have been recommended in similar examples of bronchitis. The limbs sometimes become affected with œdema; and we should order small doses Submur. Hyd., Acet. Scil. et Tinct. Digit. After recovery, the chest should be encased in a Burgundy pitch plaster, and flannels worn next the surface.

CHAPTER VII.

DISEASES OF THE DIGESTIVE ORGANS.

Icterus.—There are two varieties of this disease, the one mild and the other formidable. Few infants escape the former, but the latter is not frequent. Some of the causes that produce this affection in young persons are the same that give rise to it in adults. The long retention of the meconium, and its partial absorption, may excite the mild kind. The other causes, resembling those that operate in adults, are obstruction to the free course of the bile in the ductus hepaticus, and communis, from viscidity of the secretion; spasms of the ducts; or from enlargement of some viscus in the vicinity of either. As in every case there must ultimately be tumefaction in the region of the liver, this circumstance may have given rise to the notion that this organ is involved, while such a state must generally be consecutive to biliary derangement.

The mild variety is frequently ushered in without any observable derangement. In other cases the young patient may at first appear languid, indifferent whether he embraces the nipple or not, or actually refuses it; he is observed to sleep more than usual, to start occasionally while in this state, and sometimes to moan. This mild species commences in two or three days after birth, with or without one or other of the foregoing symptoms, which are followed in some hours by yellowness of the surface in general, while a similar colour pervades the nails and conjunctiva.

The severe variety is attended with considerable derangement of several functions. The pulse is accelerated, the skin hot and dry, respiration hurried, and the secretions are impaired. What transudes the skin is high coloured, and

imparts a yellow aspect to the linen of the patient. The excreta vary in appearance; sometimes by being of a pale or whitish colour, they indicate deficiency of bile; then also they possess an offensive odour, and are constipated; in other cases, they are greenish, or actually dark, accompanied by nausea, or difficult deglutition. Flatus occasionally escapes per rectum; and from the frequent retraction of the knees upon the abdomen, the patient evidently suffers from colic. The urine feels unusually warm, is high coloured, and stains the linen of a deep yellow. This variety may appear at any period of infancy or childhood, and is as dangerous as the former is mild. When there is much fever, frequent startings, constant moaning, fulness in the region of the liver, and dislike to the breast, the prognosis must be unfavourable. When fatal, the disease generally runs its course in from seven to ten days; and towards the close, convulsions are often present. On dissection the liver is firmer than natural; the gall-bladder, except where the stools were dark, distended with bile; the peritonæum at many points much congested; and the intestines yellow.

It is difficult to lay down a plan of treatment that may be generally adopted in the severe species, since we are most frequently unacquainted with its cause; but in the mild variety this uncertainty is of no moment, for it almost always disappears without any remedy; or requires, at most, but one or two gentle laxatives. Generally we must be satisfied with the adoption of such measures as are calculated to subdue irritation. Among the earliest and most salutary means, the free evacuation of the bowels must be mentioned, and this should be accomplished, not by very active cathartics as calomel and scammony, but by milder medicines as castor oil, magnesia and rhubarb, and enemata containing some infusion of senna with a proportion of neutral salt. In many cases, I have seen complete success follow the application of leeches to the hypochondriac region; and with this I have been accustomed to conjoin with great advantage, a large dose of the Tinct. Hyosc. and the submersion of the body in water betwixt tepid and warm. After local bleeding, some stimulating embrocation may be usefully rubbed on the left hypochondrium, and also over the abdomen. Upon the principle of inducing general relaxation, after the unsuccessful trial of the foregoing plan, Vin. Antim. in small doses, *ad nauseam*, promises to be useful; but it should not be exhibited to the extent of exciting vomiting,—a practice which my opportunities have not encouraged me to recommend.

Aphthæ.—Under this head I shall treat of three varieties of this disease; the one very common, but mild, in young infants; the second, less prevalent, though more troublesome; and the third, a highly malignant affection, and sometimes epidemic among children.

Aphthæ Mites.—This first may attack infants indiscriminately, and almost always arises, as may be elicited by proper inquiry, from their being indulged in too much, or vitiated nourishment, to which may be added, the influence of too many being crowded together, or a residence in damp, ill-ventilated quarters. Though this complaint be generally limited to subjects a few weeks old, yet it is not uncommon at any age, in protracted diseases. The affection is characterized by enlargement of the mucous follicles, a white crust forming over them, after which they inflame and ulcerate; on examining these crusts with the microscope, I have found them to consist chiefly of cryptogamic vegetations, similar to those observed on the teeth. When carefully raised from the mucous membrane, they may be observed to dip into the open mouth of its follicle, from which it is probable they grow, as I have frequently seen a long stem of the plant penetrating the entire layer of epithelial cells. These first appear on the inside of the lips, and thereafter are scattered over the tongue, the whole inside of the mouth, and the fauces, like small bits of curdled milk. There is an unusual secretion of saliva, the mouth feels warm, the child is fretful, embracing the nipple makes him uneasy, there is scarcely any constitutional derangement, and the stools are greenish, have an unpleasant odour, and occasion griping. After the fourth day, the crusts become yellow, and separate; but by suffering the cause to act, they may be repeatedly produced, and a greater degree of irritation occasioned.

Aphthæ Graves.—The second variety is preceded or accompanied by a fever, which some suppose contagious; but this opinion I cannot corroborate. For a day, or longer, the patient is drowsy, which, as well as the febrile action, is occasionally mitigated on the appearance of the eruption. Another precursor of this affection is spasms. The crusts are numerous on the mouth, but more confluent than the first variety; sometimes, indeed, they form large patches. There seems to be great uneasiness in the intestines, for there is frequent vomiting and diarrhœa, what is rejected possessing an acid odour, and the excreta being green, and so acrid as to excoriate the anus. The affection of the mouth is so much more severe than in the former variety, as almost to prevent the child sucking; and like it, also, the crusts

may be repeatedly produced, and the patient destroyed by exhaustion, and protracted irritation. From the excessive suffering in the abdomen, there is reason to believe, that the complaint extends along the alimentary canal; and this need scarcely be questioned, since its inner lining is a continuous texture. The causes here are the same as in the foregoing. The prognosis in this kind requires to be studied, for it may have unpleasant consequences; *first*, by the severe derangement of the alimentary canal; *secondly*, by the disease extending into the trachea; and, *thirdly*, by sudden sinking of the living powers. When the case portends fatal consequences from the state of the bowels, we have vomiting and purging, tenderness of the abdomen, with or without tumidity, drowsiness, hurried and oppressed breathing, frequent pulse, moaning, languor, and spasms. Should, on the other hand, the issue be favourable, there will be less fever, the crusts will be fewer, and not coalesce; and at the end of three or four days, they will become yellow, and recovery follows. A paucity of the aphthæ, unattended by drowsiness, debility, or spasms, is at all times favourable. Should the malady extend along the air passage, there will be cough, difficult respiration resembling that of croup in sound, and the patient is speedily cut off: more frequently, however, the disease passes along the œsophagus. When the crusts, instead of becoming yellow, assume first, a purple hue, and then change to brown or black, with prostration of strength, moaning, drowsiness, and fœtid breath, these phenomena indicate great sinking of the living powers.

Aphthæ Malignæ.—This variety is highly dangerous and untractable. It shows itself as an epidemic among children, chiefly in spring and autumn; and except this influence, we know of no other cause; though, from several of a family being seized in rapid succession, it is vulgarly supposed to be contagious. For a day or two the patient is fretful, but does not complain particularly of the throat; when examined, however, one of the tonsils is of a deep red colour, and it may or may not appear slightly enlarged. The malady may, by preference, attack the arches of the palate; but whether the one or the other, the crusts are pure white; and when they separate, the subjacent tissue presents the same deep colour as the ambient parts, and the exudation reappears in a few hours. In many of these cases, there is much swelling and pain at the angle of the jaw, the cheeks are fuller than usual, and glossy; and the fever is not very high, but there is much debility. At the commencement the countenance is flushed, but very soon it becomes pale, and the whole fea-

tures are indicative of great and general prostration; the eyes are inanimate and suffused with tears; there is listlessness; the tongue is coated with yellow fur; the affected tissues of the throat undergo successive changes from deep red, to purple, brown, or black. In many cases, the danger is in a ratio with the size of the external swelling. The affected tonsil in some instances may be compared to the largest red grape in size and colour; the breath possesses a peculiar sour odour; disorganization at length commences, and blood is discharged by the mouth and nostrils, or it is swallowed, which communicates to the fæces a pitchy aspect. Sometimes there is vomiting, but this is more apt to appear in the early than in the latter stages, at which period the circulation is hurried; in the commencement, however, it is little beyond its natural standard; but it does not, even in the early stages, possess much strength: the breathing is accelerated and irregular, and the child seems to be in extreme agony. Blistered surfaces often become gangrenous. At other times the disease extends to the larynx and trachea; and whether it follow this or the preceding course, I have never seen any of the patients recover; wherefore nothing but a *decidedly fatal prognosis* can be delivered. The incipient stage is the only time at which any service can be rendered to the patient. In some children who survived the attack, the voice continued for some time afterwards to be characterised by a snuffling noise. *Autopsies* exhibit ulcers about the throat; congestion or inflammation of the œsophagus, stomach, or intestines; and sometimes *ramollissement* of the mucous membrane of one or more portions of the latter tube.

The treatment in the *first variety* is simple. *First*, the diet is to be regulated; *secondly*, cleanliness is to be strictly observed; *thirdly*, the bowels are to be free; *fourthly*, the patient should be kept warm, and frequently in the open air. Surfeiting, as well as indigestible or vitiated aliment of every description, is to be avoided; and when this point alone is properly attended to, it is seldom that any other direction is necessary in this variety.

In treating the *second kind*, our principal object is to avoid every circumstance that can produce irritation, and to adopt such measures as are calculated to subdue that which is already present. Stimuli of every description are to be interdicted. If the child should be deriving his support from the breast, no other nourishment must be allowed: when it is reared artificially, nothing more nutritive than milk whey, milk and water, or thin arrow root, should be permitted,

until convalescence be established. To defend the passages from the irritation of the secretions, a little almond emulsion may be allowed occasionally; and to fulfil the same object, the free use of all mild bland fluids is proper. Small doses of Nitras. Potass., Vin. Ipecac., and Tinct. Hyosc., largely diluted with water, and rendered palatable with sugar, are highly useful. Leeches should be applied to the region of the stomach; and enemata of warm water alone are to be frequently exhibited. All the regulations laid down for the mild variety are here also to be strictly observed. When convalescence is established, a gradual return to nourishing aliment is proper: animal soups, calf's-foot jelly, and a country residence should be recommended.

The external remedies applicable to the *malignant* variety are leeches, blisters, and the application of escharotics to the diseased part. Though much has been said by some people of the use of these measures, yet it is proper to be aware, that in by far the majority of instances, the disease will resist the whole of them, at whatever period they are employed. In regard to leeches, as the malady, even in full vigorous subjects, is always characterised by symptoms of debility, these are to be resorted to cautiously; and if there be a case in which the effects of remedies ought to be watched, those who have experienced the responsibilities of practice will concede this to be one. Where blisters have been applied, they should not be suffered to remain long on the part, and they are to be replaced by a warm emollient cataplasm, frequently renewed. The ordinary applications are, the Nitras. Argent., in its crude state, or in solution; the Sulph. Cupri., and the Chlor. Sod. To speak the sentiments of my brethren, and what I have myself experienced, Lunar Caustic in its crude state, is decidedly the best remedy; and generally it produces no more irritation than would arise from the introduction of a feather. Unless it occasion marked pain for some time after its use, it should be applied twice daily. One drachm Chlor. Sod., blended with three ounces of honey, and frequently given in portions the size of a *small* grape, will be found an excellent detergent. Animal soups, and a moderate allowance of wine, should be directed from the commencement, and a free circulation of air is of the utmost consequence.

Cancrum Oris.—This is a deep, foul, fœtid ulcer, with irregular ragged margins, which, during the evolution of the deciduous teeth, or when they are shedding, may commence on the inside of the lips, cheeks, or gums, and is attended with copious ptyalism. When the *latter* parts are its seat,

the teeth become loose, pus forms in their sockets, and they drop out; or the lower maxilla even may be affected, and exfoliate to a considerable extent. The disease commences, not in the centre, but at some point in either side of the gum, which is inflamed, soon ulcerates, and is covered with a white or brown slough. Sometimes this begins in the cheek by swelling and induration, followed shortly by lividity at a particular point, and ulceration, which extends to the tongue and lips; or it may commence in the latter and spread to the others. The whole lining of the mouth is tumefied, and, with the tongue, presents a horrid spectacle of disease; the upper lip is much more swelled than the lower one, and its lining is red and glossy.

There is another variety of this affection, which is confined to the cheek alone, and in which the inflammatory action is more rapid; for frequently it is scarcely known to exist, when a livid spot, not preceded or accompanied by any marked heat, pain, or swelling, is seen. These complaints are more frequently met with among the children of the poor, where I have sometimes traced them to want of cleanliness, impure air, improper nursing, and unwholesome food. When the gum is affected, and the jaw exfoliates, *a guarded opinion* should be offered, for although cicatrization follows, yet the teeth may not reappear. Cases of ulceration, or gangrene, are formidable; for the parietes may ultimately be perforated, and the matter discharged through the cheek, or some other point. When gangrene takes place, the child, after suffering from fever for a few days, moans, refuses food, becomes drowsy, and dies. Whenever ulcers appear, they should be touched either with Argent. Nitras., a strong solution of it, or of Chlor. Sod. If the patient be so old that he can be instructed to wash the mouth, the latter solution may be used, or one of Quinine in port wine. Cleanliness, a generous diet, warm clothing, and country air should be recommended. Of late a solution Chlor. Potass., given internally, has been highly lauded. The tepid bath will be found useful in all the stages of the disease.

Vomiting.—This may occur a few hours after birth. It may arise from the pressure of the enlarged liver, but more frequently from permitting the infant to partake too freely of the breast, or of some other nourishment. A frequent cause is much dandling too soon after taking food. Under some of these circumstances, the fibres of the stomach are simply irritated by distension to relieve themselves. If the milk be impaired in its properties, or too rich, or if food be allowed which is indigestible, a compound may re-

sult from long detention, which shall excite irritation and vomiting. When acid is ingenerated, it will have the same effect. So long as the contents of the organ, when ejected, do not emit a sour odour, or present an unhealthy aspect, the derangement need not cause any alarm. When what is rejected, however, exhibits characters the reverse of these, or when it consists of mucus, and is attended with general excitement, the case ought to command attention. Vomiting is frequently symptomatic of some formidable disease, as inflammation of the brain, medulla spinalis, stomach, bowels, and other abdominal viscera. Except of pertussis, it is rarely a symptom of any affection of the chest.

The mode of relief is obvious, when the quantity or quality of the food is the exciting cause. A dose of Ipecacuan or of its wine, according to the age of the infant, should be given to rid the stomach of its contents; and after this has been effected, a smart cathartic enema to act on the bowels. After the primæ viæ have been attended to, a compress immersed in ardent spirits, applied on the epigastric region, will be found useful; and a small quantity of some stimulus given internally, as negus, or Tinct. Cinnam.: if the breath, or what is vomited, possess a sour odour, Chalk Julep, containing a few drops Tinct. Op. will be found eligible. When the child is unwilling to hold up the head, or suffers it constantly to fall upon the shoulder of the nurse, and when vomiting is attended with suffusion of tears, intolerance of light, flushed countenance, cerebral irritation may safely be suspected, and an adequate number of leeches should be applied on the back of the neck, and enemata of warm water simply, repeatedly exhibited. Some children have naturally a stomach so irritable, that very trifling causes excite vomiting, wherefore they should not be tossed about after having taken nourishment; and at any time when there is a disposition to rejection, the quantity of aliment ought to be more sparing than in a state of health.

Constipation.—This, most generally, is an acquired state, but occasionally it is constitutional. In the latter case, one of the parents may be similarly affected; but costiveness from indolence, as too frequently happens in females of all ranks, is not to be confounded with that which seems natural to some people. Under the head of acquired causes may be mentioned, indulgence by the nurse in food which is calculated to induce constipation in her own person, indolence, neglecting to entice the infant to evacuate the bowels at stated periods; and sometimes the fault lies with the patient, who, from spasmodic stricture of the rectum, and con-

sequent pain during the exoneration of the fæces, retains them for an unusual period, whereby a disposition to constipation is induced. In this condition the infant screams when about to evacuate the rectum, and thereafter a few drops of blood may be observed. Nature intended the young of our race to have from two to three evacuations daily, or in many instances even four, and where this arrangement has been interfered with, formidable complaints may arise.

When costiveness is acquired, it is often impossible to afford permanent relief; and though the child has but one evacuation daily, yet if it be healthy in other respects, frequently, no benefit would arise from exciting the intestines to greater action. But whenever he passes twenty-four hours, without an evacuation, some medicine should be exhibited. Calomel, as an alterative, is frequently used to change this condition of the bowels, and is often effectual while continued; but when withdrawn, constipation returns. Independently of its inefficacy, the frequent use of this medicine lays a foundation in children for future delicacy. Adequate doses of Senna and Castor Oil, alternated with mild enemata, are safer, and answer every purpose. A most useful formula is a decoction of ℥ij of Senna in twenty-four ounces of water, to which ℥ij of Aloes in Powder should be added, and the whole rendered thick with raw sugar; of which a dessert spoonful will be a dose for an infant six months old. When the milk of the nurse, or too sedentary a habit, gives rise to constipation, her diet should be changed, and a greater degree of exercise in the open air insisted on. Where it has been neglected to establish a habit of evacuating the bowels at regular periods, this practice should be rigidly observed. In spasmodic stricture of the rectum, immersing the nates in warm water, and occasionally introducing a wax taper, gradually increased in thickness, into the rectum, will be found a useful practice.

Diarrhœa.—During the first two or three years of life, this is one of the most prevalent complaints, owing to the great extent of the canal, its liability to irritation, and its extensive sympathies with organs of the first importance in the animal economy, as the skin, stomach, and liver. To the foregoing predisposing conditions, the great sensibility of the system must be added. Diarrhœa consists in the more frequent evacuation, and liquid consistence of the alvine secretions, than in a state of health; and there are few cases of it entirely free from tenesmus. The *exciting causes* may be divided into such as act either directly or indirectly, on the alimentary canal. To the first order may be referred arti-

cles taken into the stomach which produce irritation by their quality or quantity, or by the changes which they undergo in consequence of their long detention. Acescent fruit, ripe or otherwise, when first indulged in, frequently and quickly acts in the former manner; surfeiting is by no means an uncommon cause of purging. Milk impaired in its properties, from being too old, from the nurse menstruating, or from her being very susceptible to the influence of the mental passions, is often speedy in its effects. Morbid biliary, or pancretic secretions, owing to disease of the organs by which they are produced, may be considered direct causes. Of the causes which act indirectly, the most frequent are exposure to cold, the irritation of teething, neglect of personal cleanliness, fear, derangement of the cerebrum communicated by sympathy to the bowels; or the latter in their turn, may, in a similar manner, occasion disease of the brain.

The more immediate causes of this affection are various. They may consist in the preternatural action of the muscular fibres of the intestinal tube, whereby its contents are prematurely discharged; in increased secretion, or diminished absorption; in high irritation, little short of inflammation of the mucous coat; or in actual inflammation; or it may arise from relaxation of the bowels.

Diarrhœa does not continue long without inducing derangement in many organs. The soft parts soon lose their natural firmness, become flabby, and atrophied, from the nutritious part of the food being too quickly carried off. A sallowness sooner or later pervades the whole surface, the child ceases to walk, if he has acquired this power; there is perpetual fretfulness, the liver, the stomach, and mesenteric glands become involved. According to the internal structures which are affected, and their extent of derangement, we may, or may not, have vascular excitement. Burning heat of the palms of the hands, and soles of the feet, is almost a constant symptom. Griping, to some extent, is always more or less present; and so is tenesmus, when there is much irritation, or the case has been protracted. The urinary organs do not escape,—the secretion is often pale, frequently voided, and diminished in quantity. Ultimately, the mouth becomes aphthous, the anus excoriated, the rectum protruded, the lower limbs œdematous, and the patient is drowsy. The alvine dejections are extremely variable in appearance. *First*, they may be liquid almost as serum, of the colour of oatmeal gruel, the dejections pretty copious, and apparently unaccompanied by straining; *secondly*, they may be of a pale yellow, rather copious, and of greater con-

sistence; *thirdly*, they are sometimes the colour of clay, presenting a shade of very light green; *fourthly*, they are occasionally as green as grass; *fifthly*, they resemble mud water; and, *sixthly*, they are sometimes of a bright yellow, slimy, scanty, streaked with blood, and attended with much griping and straining. The *first* is the most simple of the whole, and consists in an increased secretion of the thinner fluids of the body, generally arising from the balance betwixt the vessels of the skin and those of the inner surface of the bowels being disturbed, by exposure to cold; it is attended with nausea and thirst, but scarcely any increase of temperature. Irritation from dentition, from acrid matter lodging in the intestines, or from improper nourishment, may give rise to the *second*. It is generally attended by peevishness, sallowness of countenance, variable appetite and pulse. The *third* and *fourth* most generally arise from disordered function of the liver, whose secretion may be vitiated, or profuse in quantity, and possess an acrid odour. This organ may have become deranged from a neglect of personal cleanliness, want of warm clothing, and the influence of the stomach deranged by improper food. The *fifth* variety is observed in protracted cases, shows high irritation, more especially of the colon, is generally attended with much uneasiness, straining, and fœtor, accelerated pulse, and high temperature. Actual inflammation of the mucous tunic of the colon, is frequently the source of the *sixth* variety. The patient generally complains of much uneasiness, which is increased by freely applying the hand to the abdomen, and there is incessant desire to void the fæces. Sometimes the contents of the bowels are frequently evacuated, and of a more liquid consistence than natural, containing undigested aliment, or a white viscid fluid, resembling chyle. The latter of these two varieties is very rare; the *first* indicates an impaired condition of the gastric juice; and the *second*, disease of the lacteals, which are sure to be involved in every instance of protracted diarrhœa; and frequently also, when the liver is diseased.

In the *prognosis*, protracted cases, with evening exacerbations, require a guarded opinion; as also those in which the food is passed undigested, or in which streaks of blood are to be seen, more or less constantly. Diarrhœa supervening to any of the exanthemata, or connected with deranged hepatic function of long standing, is often obstinate. Aphthous mouth, general wasting, œdema of the lower limbs, and drowsiness, are very unfavourable symptoms. Diarrhœa, however, may continue for a long time without any material injury to the health; but in children of a strumous

habit, it is very apt to be followed by tabes mesenterica. Where the exciting cause can be removed, and the complaint has been early attended to, the case almost always ends favourably.

In autopsies, we often detect evidences of inflammation; hence, frequently a pulpy state of the mucous lining, with excavations, enlargement of the mesenteric glands, and sometimes unusual congestion, or actual inflammation of the peritonæum. The liver seldom escapes becoming more or less indurated; in some rare instances, it is softened. The most usual morbid appearances are introsusceptions, which, in some instances, have been found very numerous.

For the relief of this affection, we have, *first*, to ascertain, and, if possible, remove, the exciting causes; *secondly*, to palliate unpleasant symptoms; and, *thirdly*, to economise the vigour of the patient. The stools should be daily seen; we should know the nature of the infant's nourishment, and under what regulations it is given,—whether he be indulged whenever he becomes fretful; we should examine the skin to determine whether he be properly washed; and the clothes are to be seen to know whether they are kept clean and dry, or are permitted to be constantly soiled, and drenched with urine. We ought also to learn something of the habits and dispositions of the parent or nurse, and whether either, should the infant be still on the breast, be menstruating or not. The young practitioner should be aware, that as well among the affluent as the humbler ranks of life, children are as much neglected when indisposed, as they are scrupulously attended to in a state of health. For, according to their impression, the child will catch cold, and many other complaints, if he be kept clean. If we find the skin neglected, we insist on the duty of washing its person being regularly performed. Having settled the foregoing points, and it is in vain otherwise to expect success, we may find the removal of the disease easy.

The most judicious practice in every recent case of this complaint, is to clear out the bowels by some laxative. If there be fever, a *moderate* dose of Castor Oil will answer best, and the excreta should be preserved for inspection; but if there is no excitement, no medicine can be more eligible than Rhubarb in small doses; and this plan must be continued every alternate day, so long as any indurated portions, or dark matters are discharged. Where the milk is rejected in a curdled state, or where the alvine dejections possess an acid odour, Magnesia should have the preference. Thereafter we proceed to moderate the excessive secretion, and to

attack the exciting causes. Hæmatox. Campech., or Cort. Cass. Cinnam. ℥ij, et Aq. Bullient. ℥iv, with Gum of Kino, or of Catechu, ℥ss added to either, and given in small doses, will be found very useful in moderating the discharge. When acid predominates in the primæ viæ, a mixture with Carb. Calc. prœp. ℥iss et Aq. Cinnam. ℥iij will answer best. If it appear that the system is debilitated by excessive evacuation, a few drops Tinct. Opii should be added to any of the above formulæ; but we must avoid at any time abruptly checking the diarrhœa, lest congestion of the brain, or of some other weak organ, should follow.

Of the exciting causes there is none more apt to be encountered than pampering or giving too much food. When this is the case, and people will often pertinaciously deny it, we insist on everything being relinquished except the contents of the breast. If the patient be reared by a hired nurse, she should be watched, lest the child be fed to induce him to sleep. There is no measure so necessary and conducive to the suspension of diarrhœa as the regulation of diet. In Scotland, oatmeal constitutes a large share of their nourishment, but it is indigestible, and every form of it ought to be prohibited. The young of our race in some districts are indulged in pastry, pies, steak, butter, cream, and even good old port; and most certainly everything of this nature should be prohibited. Beaf tea, even, is improper, when there is fever. To children who are still sucking, nothing but the breast should be allowed. The best diet for those who have been weaned, is rusk, rice, sago, arrow root, or cabin biscuit, boiled in milk. It should be sparing in quantity while the purging continues; and neither greasy productions of any description, nor fruit are to be allowed. Should dentition be the obvious cause, the gums are to be examined and scarified over the points of such teeth as are most advanced. Where exposure to cold would appear to have been accessory to the complaint, doses Vin. Ipecac. during the day, immersion in warm water at bed-time, and under-garments of flannel, will be the best treatment. Ablution with warm water should always be substituted for cold, when diarrhœa is present, from whatever cause. One of the best internal remedies, where cold has been the exciting cause, and more especially when there is much straining, is Ipecacuan and Rhubarb, in small doses combined, and frequently repeated.

Of all the causes, deranged hepatic function, with or without diseased mesenteric glands, is the most obstinate. Too frequently chronic cases have no other source. In this variety, which is met with principally after weaning, the diet

should be entirely free from unctuous matter, the body clothed in flannels, some powerful liniment rubbed over the abdomen morning and evening, a broad bandage tied pretty firmly around the abdomen, a country residence chosen for the patient, and the Submuriate, or Hydrargyrum cum Creta as a laxative, alternated with Rhubarb; but in no instance are aperients to be ordered in large doses. Much advantage will also be derived from the tepid salt water bath. When we suspect great irritation, or actual inflammation of the mucous tunic, leeches are to be placed on the abdomen, thereafter a warm cataplasm, and the bowels are to be kept free by an occasional enema of warm water. The symptoms which require to be palliated are aphthæ, excoriations around the anus, sickness or vomiting, œdema of the sacral limbs, and drowsiness. For the first of these, Sol. Suborac. Sod., or Infus. Tamarind. Ind., will be found useful. When the anus is very tender, no remedy is more successful than a thin compress immersed in equal parts Vin. Opii., et Aq., or anointing the excoriations with an ointment composed of Adip. Suil. ℥j, Ox. Zinc. ℥j. Nausea or vomiting is to be remedied by abstaining as much as possible from fluids,—a rule highly necessary to be observed in all cases, and at all periods of this affection; and the nourishment must also be more limited than in health: a compress immersed in ardent spirits, leeches, or a blister, are all useful. In œdema, small doses Æth. Nitros. and Tinct. Digital. combined, in the proportion of two parts of the former and one of the latter, are to be ordered. If there be drowsiness, or actual coma, the hair should be cut short, a blister applied to the back of the neck, and mashed garlic to the feet,—a remedy, though little used in the present day, which is very serviceable in many complaints. When the diarrhœa at any time affects the vigour of the child, or occasions emaciation, we are imperiously called upon to moderate it by Tinct. Opii, when the ordinary means are not sufficient. The best mode of exhibiting it is, in a thin solution of starch, in the form of an enema. To support the strength, the infant, during fine warm weather, should be much in the open air. When there is no fever, beef tea, chicken soup, or calf's-foot jelly, may be allowed; and occasionally a little sack-whey. Should the stomach be too irritable to retain what might be considered sufficient, nourishment may be exhibited by the rectum. When there is much excitement, there should not be a nearer approach to animal diet than milk; arrow root, tapioca, and sago, will also constitute eligible nourishment.

Colic.—There are several varieties of this affection, as ileus, and that arising from flatulency. From the extreme sensibility of the bowels, children are exceedingly liable to these complaints. Males are more harassed with the flatulent kind than female infants. The milk of the nurse may be impaired in its properties by various causes, and give rise to it; or it may be produced by improper food; and matrons themselves firmly believe that the milk of a nurse is more productive of flatulence after one confinement than another. If the food be indigestible, and consequently long retained, the changes which it undergoes are very apt to excite slighter degrees of this complaint. Very often it cannot be accounted for; but there is nothing more certain than the influence of improper nourishment; and in such cases the alvine evacuations are green when voided, or become deeply so, shortly after they have been passed. The symptoms in ordinary colic are, absence of fever, the incurvation of the trunk, incessant screaming, retraction of the pelvic limbs upon the abdomen, obstinate constipation, vomiting, the urine discharged *guttatim* and with much pain, and the expulsion of flatus, which affords temporary relief. When the individual is old enough to describe his sensations, he complains of twisting at the umbilicus; and when pressure is applied to it, he is rather relieved.

In ileus, on the contrary, the application of the hand to the abdomen excites pain, which is limited to a point; the cavity becomes tympanitic; there is stercoraceous vomiting, with tenesmus, and rapid prostration of strength. Sometimes the pain ceases before death; while in other cases the patient is in extreme agony. The principal difference betwixt ileus and enteritis is, that in the former we have no fever, nor do we find in autopsies false membranes; while both these are very distinctly marked in the latter. The prognosis must be very guarded, for neither the condition of the pulse, nor of the alvine dejections, can be relied on. No symptoms indicative of recovery can be depended on, except the cessation of vomiting and tormina, the return of animation to the countenance, and of firmness to the pulse. When the result is unfavourable, it is usually from inflammation and its consequences,—changes which supervene at various periods. Gangrene may take place as early as the twelfth hour in some cases, and in others not for a much longer period. On dissection, the colour of the intestines at some particular point or points may vary from a slight blush to a vivid red, purple, or livid appearance. The diseased part of the tube may be found much distended; or, when the malady is

further advanced, flabby, collapsed, and flattened. Of all these, the most frequent morbid appearance is the distension, which in some instances is enormous, and constitutes the only mark of disease. Disorganization, however, often takes place to such an extent, that the intestines may be torn simply in changing their position. Intususceptions are often observed.

In the treatment, our *first* object is to allay pain; *secondly*, to restore the functions of the alimentary canal; and, *thirdly*, to support the system. To fulfil the first indication, the local or general abstraction of blood, according to the age and strength of the patient, must take the precedence of every other remedy. When the subject is vigorous, and old enough to be bled from the arm, this mode should be preferred. In recent cases, the effect of this remedy is incredible: it should be carried the length of making an impression on the pulse, and followed up by a large dose Sol. Op. Sedat. The next remedy which should be conjoined with these, is the warm bath. It may be of immense service by relieving pain; and from its influence in producing relaxation, by restoring the natural action of the intestines. The last agent for subduing local irritation is a blister, which often proves highly useful: large emollient cataplasms should in due time be substituted, and often renewed. To meet the second indication, the warm bath and opium already mentioned, as also mild enemata, and the smoke of tobacco, are very justly lauded. Immersion in warm water, occasionally repeated, and injections of it simply, or with some assafœtida, are highly beneficial. The tobacco, though serviceable in form of an enema in the ileus of adults, is not, however, a safe remedy in children. Enemata of thin gruel, containing about an eighth part of the Volatile Spirits of Turpentine, is exceedingly useful in dislodging the flatus from the tube. Cold externally and internally applied is favourably spoken of in grown-up persons, but I have no experience of its utility in children. When the strength begins to give way, the patient should be allowed negus, nourishing soups, and calf's-foot-jelly; but if the irritability of stomach still continue, the nourishment must be exhibited *per rectum*. Aloetic Wine in large doses is strongly recommended by Dr Abercrombie, in this stage of the disease.

In infants flatulent colic is exceedingly troublesome. Assafœtida dissolved in warm water, and thrown into the rectum, and warm water simply, are extremely useful remedies; or introducing an enema pipe into the rectum, gives immediate relief. A moderate quantity of an aqueous solution of

the fœtid gum just mentioned, with a few drops of the Sol. Op. Sedat., and a little Aq. Menth., are very effectual. A small dose Tinct. Opii Camph. is very useful; but whatever remedy be ordered, it should soon be exchanged for some other. The bowels are to be kept free by magnesia; and food calculated to generate flatus, or too much nourishment, abstained from.

Introsusception.—This is principally met with among children, though not peculiar to them, since examples of it may occur in adults. This complaint may be a sequela of ileus, diarrhœa, and vermes; and the injudicious use of aperients may be a cause. In many cases no reason can be assigned. It so completely resembles ileus, that we can never almost be certain of its presence. The symptoms said to be peculiar to it are, bloody mucous discharges from the bowels, severe straining, at last complete suspension of alvine dejections, violent screaming, vomiting of everything that is swallowed, as also of stercoraceous matter, and ultimately, convulsions. In some instances, again, from the infant scarcely suffering any thing, its presence is not suspected almost during life, and it is only discovered on dissection. It is a very dangerous disease, and its usual terminations are inflammation and gangrene. At the same time recoveries have happened under circumstances which are scarcely credible. Large portions of intestine have sloughed off, been discharged by stool, and recovery followed.

On dissection, besides inflammation and gangrene, which are common effects, inversions of intestine to an incredible number and extent are discovered. The invaginated portion generally adheres firmly to that which surrounds it; and a tumour is formed that can be distinctly felt through the abdominal parietes; but in other examples, again, there is neither adhesion nor inflammation. By far the best practice in these cases is, the frequent injection of warm water, in a continued stream, for a few minutes, into the rectum, which would seem to me to have a mechanical effect, and has, in my practice, relieved several cases. Leeches, warm bath, and blisters, are useful; and inflating the bowels per rectum has been recommended. Unless the complaint be attacked early, little reliance need be placed on any remedy. Ipecacuan emetics have been lauded, and they would seem feasible agents.

Gastritis, Peritonitis, and Enteritis.—After having said so much regarding ileus, the present affections may be discussed somewhat briefly. *Inflammation of the stomach* is rare in children, and when it does occurr, it is not from ordinary, so

frequently as from accidental causes, such as swallowing articles which act immediately on the mucous lining, as hot liquids, ardent spirits, and concentrated acids, with other corrosive matters. Sometimes the stomach and intestines are found in a state of inflammation in the still-born fœtus. To cold, so common a cause of excitement of other organs, I have never been able to trace it; and where I found the peritonæal coat of the viscus affected, there was reason to believe that the disease had extended to it from some other part. It is not easily detected, from its symptoms resembling those of similar affections in organs with which it is nearly connected. The features are shrunk; there is an appearance of deep anxiety; a livid hue pervades the lips, more especially the upper one; there is urgent thirst, but everything swallowed is rejected; the pulse is much accelerated and contracted; the patient frequently screams; if old enough to describe his sensations, he complains of burning heat in the throat and stomach; and in the epigastric region there is tension and incessant pain.

Enteritis.—This may be produced by the same causes as gastritis, or by an extension of peritonæal excitement, or long retention and consequent induration of fæces. As in inflammation of the stomach, there is an appearance of anguish, and vomiting more or less constant from the first; in which last, as well as in the presence of obstinate constipation, it principally differs from peritonitis. In enteritis also, the pulse is softer, and the pain in the abdomen is not so acute. In advanced stages tympanitis supervenes, followed by rapid dissolution. All inflammatory affections have a more rapid course in young subjects than in adults, and more especially those which seize the internal tissues; wherefore, they must always be considered extremely dangerous.

Peritonitis.—This complaint is very frequent; and its most common cause is exposure to cold from insufficient clothing, or from those which are worn being constantly drenched with urine. There is intense fever, a somewhat flushed countenance, frequent resisting pulse, retraction of the pelvic limbs upon the abdomen as in colic, but unlike it, the pain, which it severe, does not intermit, nor is there any vomiting except in the advanced stages. Respiration is hurried, and the patient is thrown into agonising sufferings at the moment of coughing or sneezing. We know the inflammatory action to be confined to the peritonæum, by the pain being very acute, the bowels easily regulated, and the absence of tympanitis. When the disease is protracted, we have constant fever, evening exacerbations, gradual emaciation, incessant

thirst, and impaired appetite. The excreta are extremely variable in their appearance; diarrhœa and constipation may alternate; or the fæces are slimy, streaked with blood or evacuated in indurated portions, and frequently accompanied with intolerable fœtor. Sometimes abscesses form which burst into the bowels or abdominal cavity, an event which is known by diminished suffering, successive rigors, and œdema of the sacral limbs. Though such cases are exceedingly unfavourable, yet some examples attended with most untoward symptoms, have been known to recover.

In autopsies of *gastritis*, if the case has proved fatal in an early stage, we shall find the inner coat minutely injected, and pulpy; but if the disease has existed for some time, the tunics may be thickened, and the inner one interspersed with small ulcers; or the stomach itself may be so much disorganised, as to be perforated; or so much softened, that in changing its position, it bursts between the fingers. Dissections of *peritonitis* chiefly present a copious deposition of coagulated lymph on the surface, and betwixt the convolutions of the intestines, by which they are made to cohere. The vessels of their peritonæal covering, are more or less minutely injected at different points; and hence the varied colour of the tube, being sometimes vivid red, at other times purple, or approaching to a livid hue. Similar morbid changes are seen on the peritonæum lining the abdominal parietes, and on that of the liver; and very often the omentum does not escape. Sometimes the general cavity is inundated with serum. In some rare instances, we find the tube perforated, and its contents effused into the abdomen. The *post mortem* appearances in *enteritis*, are chiefly characterized by great distension of the intestines, and gangrene more or less extensive. Inflammation is more apt to spread from the mucous tunic to the peritonæal, than from the latter to the former, and to be followed by more complete disorganization.

On the *treatment* of these affections little need be said, after having so fully detailed the morbid appearances, and since the same curative means are applicable to all of them. In the *first place*, if the subject be old enough, blood is to be taken from the general system; or if otherwise, abstracted by leeches from the region of the stomach, or from such other point of the abdomen as may seem to demand it; and as children, unless attended to early, cannot well support bleeding, its effects are to be carefully watched. *Secondly*, fomentations, by means of warm emollient cataplasms, frequently renewed, are next to follow. *Thirdly*, the warm bath will

be found particularly serviceable. *Fourthly*, should these remedies not afford relief, a blister must be applied on the proper point. *Fifthly*, the practitioner must explain to the attendants the danger of overheating the patient by a warm room, or a load of bed-clothes. *In gastritis*, and *enteritis*, nothing stronger should be used as aperients, than enemata of warm water, containing a little Olive or Castor Oil, according to the degree of action which it may be judicious to excite. Ol. Ricini, Pulv. Jalap. Comp., or even Submur. Hyd., may, however, be administered in *peritonitis;* and in this affection, also, much benefit will be derived from the use of mild enemata. When effusion has taken place into the abdomen in such quantity that fluctuation can be *distinctly* perceived, paracentesis might be required. It is of the utmost consequence to calm irritation, and with this view an anodyne should be given after bleeding, and regularly at bed-time. Sometimes both peritonitis and enteritis, especially after the premature repulsion of measles, and other acute diseases of the skin, probably from exposure to cold, assume a *chronic form*, and are most untractable. The patient is constantly fretful, affected with nocturnal fever, which is accompanied with sweats; variable appetite, at one time impaired, at another, much increased; inconstant state of the secreta, which are one day scanty and torpid, at another, loose; slight tumefaction of the belly, and pain upon pressure; clear tongue; clean urine; and gradual wasting. In these cases, frictions on the abdomen with Tart. Antim. blended with Adeps. Suill. or Iodine similarly prepared, tepid bath on the accession of the fever, country air, and warm clothing, are the usual remedies; but too frequently they are of little avail. The mildest beverages are to be allowed for drink, as milk whey, or milk and water; and these, also, until convalescence is established, will constitute sufficient nourishment.

Congestion of the Liver.—From the quantity of blood which enters this organ during fœtation, its volume at birth is considerable, which *partly* explains the size of the abdomen, the facility with which vomiting is produced in young infants, the cough that is so easily excited, and the breathlessness induced, in many cases, after the funis has been secured. Such symptoms as are apparently pectoral, might lead to a supposition of pulmonary derangement; but this is not so frequently attended by vomiting, as hepatic congestion; and moreover, the liver can be distinctly felt extending lower, and more into the left side, than in health. Induration and engorgement of the organ, with distension of the vesica fellis,

are the usual discoveries of autopsies, and this has been confirmed in numerous dissections by Billard; Dr Burns also speaks of induration of the liver, similar to cartilage. To diminish the risk of congestion of the liver laying the foundation for future disease, the funis should not be abruptly secured, while we are early to get rid of the meconium. When this state is the cause of any functional disorder, purgatives are the best remedies.

Acute Hepatitis.—The liver, from what has just been stated, is much predisposed to inflammation; and the chief causes are, exposure to cold, or impaired cutaneous function, from personal neglect, and derangement of the bowels from vitiated aliment. There is some difficulty in establishing the presence of this affection in subjects incapable of making known their own ailments. It is attended by fever, cough, enlargement of the abdomen, uneasiness on pressure, a jaundiced hue of the surface, irregular action of the bowels which are generally torpid, the fæces resembling the yolk of an egg, or light green clay, and the urine being deep red, with or without pink-coloured sediment; there is irregular appetite, nausea, pain in the abdomen, and an increase of the fever towards the evening. If it be not early arrested, it may terminate in abscess, whose contents may be discharged into the lungs, stomach, duodenum, or at the umbilicus. On dissection, we may find the excitement confined to the liver, or the intestines may also be involved, as has most frequently happened in my practice; and the former may or may not be enlarged; but the latter is what is generally observed in protracted cases. I have seen the liver much indurated, its diaphragmatic surface covered with coagulable lymph, and its concave by a preternatural membrane, while the intestines presented the usual appearances of inflammation. Neither the colour of the liver, nor any condition of the bile, can be depended on; for in numerous *autopsies* by Billard, every variety has been observed. We endeavour to remove the disease by general or local detractions of blood, purgatives, and diaphoretics. Mercurial aperients are the best, as Submur. Hyd., or Hyd. c. Creta, alternated with Senna or Castor Oil. To excite diaphoresis, Ox. Antim. c. Phos. Calc. should be combined with either of the mercurials. Flannel is to be worn next the skin, and country air recommended.

When not arrested at the commencement, inflammation of the liver may assume a chronic form, which is a very obstinate affection. It may originate in the too early repulsion of skin disease, in neglect of personal cleanliness, in torpid bowels, tabes mesenterica, or general bad health. A fre-

quent dry cough, sallow surface, irregular appetite, and white offensive stools, are the primary symptoms: the child calls for nourishment, of which at other times he is regardless; or if food be brought to him, he either refuses it, or is satisfied with the smallest quantity. These phenomena are occasionally succeeded by nausea, and bilious vomiting, with dark alvine dejections alternating with white, tumefaction of the upper part of the abdomen, colic pains, high-coloured urine, œdema of the pelvic limbs, general emaciation, and distinct hectic fever. The examination of the abdomen enables us readily to distinguish the liver much enlarged, but without pain, except when freely pressed. Ultimately, suppuration takes place, and from this, or hectic, the event is fatal. To relieve these cases, the earliest opportunity must be embraced to have the patient transferred to a congenial climate, while a course of Mercurial purgatives, judiciously conducted, mild nourishing diet, tonics, tepid bath, Iodine frictions, and warm clothing, are to be insisted on. Whatever has a tendency to disturb the functions of the skin, stomach, or bowels, must be sedulously avoided.

Congestion of the Spleen.—I select this term, since, though the organ be in some *rare* instances found enlarged in young persons, yet I never saw it inflamed: nor, for a long period does its volume increase, so as to be perceptible through the parietes of the abdomen. We distinguish this from hepatitis by the tumefaction commencing in the left hypochondrium, by there being no disturbance of any function, until the organ has acquired a large size, and especially by the absence of hepatic derangement. It is not a dangerous disease. The same treatment is required as in chronic hepatitis; and in both the application of blisters may be alternated with Iodine frictions. In children of phthisical descent, the spleen, like other structures, often forms a nidus for tubercules.

Worms.—Worms are found in many parts of the human body, but as the object of the author is to be practically useful, he may be permitted to waive the consideration of all of them, except such as infest the intestines. These are, the ascaris, trichuris, lumbricus, and tænia. The most prevalent either in children or adults, is the ascaris; and the least so, the tænia, which I never met with in a child. Whether worms be carried into the body by the food we take, or are engendered, are questions not easily determined. Dr Dewees would appear to favour the former opinion, by asserting that they are never to be found in children exclusively reared on the breast; but the assertion is incorrect. Dr Drury, a medical officer of the Russian navy, who attended my lec-

tures some years ago, observed two lumbrici in the intestines of a still-born child; Professor Brendel of Goettingen, found, in the small intestines of a premature fœtus, many diminutive ones of the same tribe; and Darelius detected a tænia in the bowels of a whelp, which he opened immediately after emancipation from its parent. It is not easily reconcileable with the knowledge of these facts, to assert that worms are produced in the human species by the transference of their ova into our bodies. Though the circumstance of these animals having been found in the bowels of a fœtus at birth, would seem a formidable objection to the adoption of the foregoing opinion, yet it is not insurmountable; for, admitting that their germs or ova are taken into the system with our food, may they not be as readily transferred from it into that of the fœtus, as poison given to the parent. To this it might be replied, that they would be destroyed by the gastric juice; but this cannot be so easily accomplished; for, according to the experiments of Dr Montin, they can support a great degree of heat; and Rosenstein assures us, that he witnessed a live tænia in a fish which had been imperfectly cooked. Again, we are informed, that they cannot live any time when ejected from the human body; but restore them to their natural food, and to a residence of similar temperature to that which they have quitted, and will this happen? Rosenstein states, that he succeeded in keeping a worm alive some time in warm water. We are also informed, that the worms found in the human species are peculiar, but this is not the case, in so far as regards the lumbricus, or tænia; both of which have been detected in many animals, and even in fish. The formation of worms in the human body cannot be more rationally explained than by admitting the transference of their ova into our system. Their rare occurrence, comparatively speaking, in children entirely reared on the breast, strongly supports this opinion. And the possibility of their ova being transferred from one body to another, has been confirmed by Pallas; who, by incision in the abdomen of one dog, introduced into it the ova of tænia from another, which in a month was destroyed, and young worms of this tribe found in its belly. The fact of certain tribes of these animals being very prevalent in some parts of the world, while they are either unknown, or cannot exist at all in other quarters, is a farther support to this hypothesis. That they are engendered in consequence of some change which takes place in the superfluous part of the food, when too long retained in the bowels, is not at all probable, since we do not find

them very frequent in dyspeptic patients, in whom there is great latitude for such a cause to act. *The conditions which favour* the appearance of worms in children, are, *first*, general feebleness, hence they are often observed during dentition; *secondly*, an unwholesome diet, wherefore they are more prevalent among the poor than those in easy circumstances; and, *thirdly*, an unhealthy residence, which explains their greater frequency among young people reared in town, than those brought up in the country.

The *ascaris* is white in colour, about half an inch in length, and nearly the thickness of a fine thread. It is generally found in the rectum, but occasionally it migrates into all the divisions of the tube. In female children it often wanders into the vagina and urethra, causing much uneasiness in the bladder, leucorrhœa, and excessive itching of the genitals; and of the anus in both sexes. *The trichuris* is from an inch to an inch and a half in length, and about the thickness of the ascaris. It is found in great numbers in the rectum, sometimes in the jejunum, and in the lower part of the ileum; and occasionally in company with other tribes. *The lumbricus* is rarely under six, or above fifteen inches in length; and its diameter nearly equals that of a goose quill. When voided it is of a red colour, as if filled with sanguineous serum; but thereafter it changes to a yellow opaque tinge. The jejunum and ileum are their usual residence, whence they sometimes wander both upwards and downwards, and make their exit either by the mouth or anus. Their number is from thirty to fifty; but several hundreds have been ejected by one person. *Of the tænia*, there are two varieties, the broad and the common. It is a very general production: but the two kinds seldom co-exist. Both may be found in the small intestines. The first variety is broader, thinner, more regular, but not so long as the second, which is of a pale white colour and of shorter portions than the broad species. More than one may be found in the same person, contrary to what had formerly been supposed. Their usual length is about thirty feet.

Much disturbance of almost every important function may be produced by the presence of worms. The digestive organs are generally the first to suffer: there is increased or diminished appetite; a variable state of the bowels,—the excreta being at one time slimy, at another loose, or sometimes constipated, and unusually fœtid in whichever of these conditions they are found. There is almost perpetual itching at the nares; tumidity of these and of the upper lip; grinding of the teeth, during sleep; frequent griping, and pruritus,

or heat and pain at the anus. From the extensive sympathies of the alimentary canal, other organs, sooner or later, participate in the derangement. The patient starts or dreams during sleep, and not unfrequently the cerebral excitement runs so high, as to terminate in convulsions, hydrocephalus, epilepsy, and chorea. There is more or less fever, a dull languid aspect, progressive emaciation, short dry cough, fœtid breath, with turbid urine. In every suspicious case, the alvine dejections should be inspected, as the presence of worms in what is voided, is the surest indication of their existence in the intestines.

The symptoms which they produce are not easily explained; we cannot say whether they act by biting in imitation of leeches, and causing great irritation; by consuming a part of our food, as a large tænia might be supposed to do; or by their peregrination from one part of the tube to another, or to a different viscus. Rosenstein states, that the tape worm has, in some instances, been found adhering so closely to the intestine, as to require the finger nail to detach it. Van Doeveren, in a child one year old which he opened, found that the intestines had been perforated by worms; and Dr Dewees relates the case of a woman who died from the sufferings produced by a worm which had forced its way by the common duct into the liver, where, after committing much injury, it returned by the same channel, and was discharged dead in two portions. Worms, though occasionally productive of fatal consequences, are generally unattended by danger.

In the treatment of worms, the indications are, *first*, to effect their expulsion; and, *secondly*, to correct the state of the system which seems favourable to their generation. Anthelmintic medicines may be divided into those which produce such action of the intestines as shall cause the ejection of worms; and into such as shall destroy them by poisoning. Under the *first* head may be placed Senna, Jalap, and Aloes; and under the *second*, the Volatile Spirits of Turpentine, Calomel, and the infusion of Tobacco. The dose should be repeated every second day; and every alternate prescription should contain a proportion Submur. Hyd. For the trichuris and ascaris, enemata of Ol. Tereb. Volat., or of a solution of Aloes in cold water, are efficacious remedies; they should be prescribed every second day, and on the intermediate one, a full dose of Senna. Lumbrici are to be got rid of under the same regulations by Calomel in the evening, and some brisk cathartic the following morning. For tænia, the Ol. Tereb. Vol. by the mouth, is a most effectual medicine; but unless

the patient live rigidly abstemious, and on as liquid a diet as possible, it will be no easy task to effect its expulsion. The diet should consist of weak beef-tea, gruel, and a limited allowance of bread. If vegetables of any description be permitted, they should be cooked, as otherwise they encourage verminition. All fruit and saccharine matters are improper. Whenever the worms have been destroyed, it is quite proper to return to a nourishing diet. Besides the remedies which have now been specified, many others are highly extolled by different practitioners. My friend Dr A. M. Adams of this city has great faith in the use of enemata of milk and lime water for ascarides: Spigelia Marilandica is also strongly recommended for the removal of the same tribe. For lumbrici, Dr Dewees speaks in strong terms of what he styles the Pink Root in infusion; and for tænia and trichuris, Salt Water, or a saturated Solution of the Muriate of Soda, by the mouth or anus; and for children who are much disposed to worms, he strongly recommends, after they have been expelled in whole or only in part, Table Salt and Carbonate of Iron, in Molasses. Mares' Milk, Semen Santonicum, and Pulv. Cort. Pom. Granati, are favourably mentioned.

To fulfil the second indication, tonics and a nourishing diet, according to the age of the patient, are to be ordered, to remove the disposition to the generation of these animals; a healthy locality should be chosen for the child; and strict attention paid to personal cleanliness. As a tonic, a weak solution of Quinine in white wine, will be very eligible. For diet, mild animal soups are best.

Tabes Mesenterica.—This consists in enlargement of the mesenteric glands, and sooner or later general emaciation, and hectic fever. It chiefly prevails among children of a strumous habit; but various causes may conduce to it, in subjects not obviously of this character. Among these none can be more frequently traced than vitiated nourishment, neglect in personal cleanliness, insufficient clothing, exposure to cold, impure air, the irritation of dentition, and of protracted diarrhœa. As, with the exception of the two latter, the causes enumerated are peculiarly liable to act among the young of the humbler classes, we can understand why this complaint should so often affect them. The liver and lacteals have reciprocal influence over each other; and consequently the former occasions derangement of the latter, but much more frequently it is the very reverse. We must view the disease as consisting in lesion of structure, whereby the transference into the system of the nutritious part of the food, is obstructed. *Three stages* may be marked in this af-

fection, which in the beginning is obscure, and is suspected more by the appearance of the fæces, than by any tumefaction of the abdomen. In the *first*, the child is observed to be more languid than usual, to have impaired digestion, much flatus in the bowels towards the evening, and a variable condition of the excreta: the alvine dejections are rarely constipated or formed, but inclined to be lax, or actually loose, often of a pale colour, attended with the discharge of much fœtid gas, and want of retentive power when the desire to expel them supervenes. The *second stage* is characterized by variable appetite, which is either voracious or much impaired, uneasiness, borborigmi, and tension of the abdomen, wherein numerous small indurated tumours can be traced. In some instances, the glands of the groins and those of the neck become affected. The *third stage* is attended with loss of appetite, great emaciation, sallow skin, much tumidity of the abdomen, hectic fever, and lienteria; and the fæces, when formed, are of a light colour, but most commonly rather liquid; frequently they are of the consistence of a custard, frothy, and not unlike yest. Ultimately some degree ef œdema of the pelvic limbs takes place. Protracted cases are most obstinate, and also those in which struma is strongly marked: in these, the disease is often called into action by the exanthemata. Light coloured, rather liquid frothy stools, with the aliment unchanged, are very unfavourable appearances. These conditions evidently show, that the functions of the stomach are much impaired, and that there is little if any secretion of bile. When the affection is not of long duration, and the patient on the whole enjoys some share of good health, it may be arrested by very simple means.

In autopsies, the mesenteric glands, invisible in the sound state to the naked eye, are now found to have attained the size of a walnut, or even that of a child's clenched hand. At first, their colour is pale, and their texture is soft and fleshy; but where there is a greater extent of morbid alteration, they become firmer, lose their fleshy aspect, assume a kind of semi-transparency, and thereafter an opaque white structure, like pulmonary tubercle and of the same colour. A large mass generally consists of three distinct textures, disposed in alternate layers. When the diseased changes have made further progress, the tubercular degeneration predominates, becomes softened, and is converted into caseous matter, or ill-conditioned suppuration. These glands are sometimes found to contain a deposition of, or at other times to be enveloped in, calcareous matter.

The indications of *treatment* are, to avoid the exciting

causes, moderate the diarrhœa, improve the general health, and regulate the diet. *First*, we must ascertain whether the irritation of teething be concerned, and scarify the gums if necessary; the skin should be examined for the sake of cleanliness, tepid ablutions ordered twice daily, with sea water, if it can be procured; warm clothing will be found highly essential, wherefore the body should be encased in flannels. *Secondly*, there is no medicine so eligible as Rhubarb, in the proportion, three times daily, of what might be deemed for the patient, a quarter of a dose; to such quantity, from half to a full grain of Ipecacuan, and some powdered Cassia, should be added. When the strength is suffering from the excreta being in excess, cretaceous Juleps, with small doses Tinct. Opii, will be found an efficient *formula*. A broad band of flannel should be constantly applied pretty firmly round the abdomen. We are at all times to avoid suppressing the evacuations abruptly, lest affections equally obstinate might supervene. *Thirdly*, we endeavour to effect the reduction of the enlarged mesenteric glands, for which Iodine has of late years been deservedly lauded. It may be used as frictions, or administered internally. In the former mode, I can speak with confidence of its utility; but from its being apt to derange the stomach, I have not been able to continue its internal use sufficiently long to derive benefit from it. Much has been said of the utility of Cod Liver Oil in this disease; I have tried it in several bad cases, but in one only did I find it of benefit, in the others it produced an incontrollable diarrhœa, which rather accelerated the fatal event. The patient should have the advantage of pure air, in the vicinity of the sea, during summer; but in the country, during cold weather; he should be out as much as possible, and encouraged by every stratagem to take all the exercise of which he is capable. During summer weather, it is better to use the sea water in a tepid state; and if any other tonic be necessary, Quinine should be given in any form that may be suitable. Mercury combined with Chalk, as an alterative, is very serviceable, especially where there is biliary derangement, and where, also, chyle predominates in the alvine evacuations: it should not, however, be long continued. The *fourth indication* requires that every thing greasy should be avoided; and during the acute stage, stimuli, and every variety of irritating nourishment. The undue use of liquids should be prohibited. Sago, tapioca, arrow root, or rice, may be allowed; and any of these boiled in milk, will constitute proper nourishment.

Prolapsus Ani.—At first, this is simply a protrusion of the

inner coat of the bowels, which, when relaxed, is much disposed to this state from its natural delicacy, and its superficial connection with the adjacent structures. The presence of ascarides in the rectum, protracted diarrhœa, and reiterated and strong efforts to empty the canal during constipation, with consequent relaxation of the parts concerned, are the causes of this affection. In length, the protrusion may amount to several inches; and when of long standing, the complaint is very troublesome. The reduction of the bowel should be effected as early as possible, by the nurse firmly applying the palm of the hand to the protrusion. When reposition is attempted, the child should be placed with the chest and abdomen undermost; and if the protrusion be extensive, it must be replaced in successive portions, by making circular pressure with the finger. Thereafter, the causes are to be obviated. Another method recently recommended is, to draw the skin around the anus to one side, while the child is at stool, which, it is said, will prevent protrusion. When severe straining at the commode is concerned, the sphincter ani, after the evacuation of the rectum, contracts strongly on the protruded portion, whereby it becomes painful, tumefied, and inflamed. In this state, fomentations, leeches, and recumbent posture, may be required, previous to any attempt at reduction. The patient should use a firmly stuffed seat; and the nates should be immersed in cold water repeatedly every day, to give tone to the parts. To fulfil the same object, the T bandage, and a compress of linen, applied on the anus, are very useful. Small doses of nux vomica are highly beneficial, as, by acting on the spinal cord, it stimulates the nerves distributed to the rectum.

Dentition.—The teeth have been divided into the temporary and permanent sets; and the formation of both commences long before birth. Even in the third month of uterine life, extending along the alveolar margin of the jaws, we perceive a groove which contains a number of lobules, closely connected: these latter are the dental capsules, which are disposed in a crescentic form, and are generally eight in number. The whole, from their intimate connection, may be detached from the maxillary sulcus; and if carefully effected, the artery and nerve of each, which constitute their pedicle, are displayed. If the inner surface of the alveolar cavity be then examined, small vertical projections are seen, corresponding to slight furrows which separate the capsules. As fœtal development advances, these rudiments of the alveolar partitions become more distinct, the projections approach each other, amalgamate, and constitute an equal

number of transverse partitions, of which the intermediate spaces form the alveoli. The dental capsules have all the same globular shape; but from the moment the tooth-cells are formed, they are no longer continuous; the osseous shell in question divides them, as it were, into as many separate sacs, which are connected by an artery and nerve to the bottom of the maxillary groove; and these bags receive the form and the direction that the socket in which each is separately enclosed, imprints upon them.

At birth, we can distinctly trace, especially in the lower maxilla, five partitions. The two first, flattened laterally, are destined to receive the two first incisors; the third, narrower, and commonly oblique from below upwards, and from behind forwards, which is pressed between the two first and the fourth, is intended for the canine; and lastly, the fourth, which is larger and rounder, is the socket for the first molar. The fifth alveolar cavity, for the third and fourth molars, extends from this last, almost beyond the coronoid process.

In the bottom of the maxillary fossa, inclining throughout towards the interior of the mouth, are found an artery and nerve, which furnish minute branches to the germ of the teeth. The maxillary furrow in the upper, is narrower and shorter than that in the lower jaw; wherefore, the process just described, is less regular; but upon the whole, it advances in nearly the same manner.

The germ of the tooth is composed of two vascular membranes, to which a fluid is interposed, that diminishes as fœtal development advances: the external is more loose, soft, and spongy than the internal, and its connection with the gum can be distinctly traced. The internal is thinner than the external membrane, from which, and from the germ, it is quite distinct. Its connection with the tooth, to the formation of which it contributes, is more intimate than the outer one. This double sac contains a yellow, reddish, viscid fluid, in the centre of which, through time, a more dense point is recognised, which is the rudiment of the tooth, and which, also, in a short period, is itself enveloped in a fine membrane. In proportion as the follicle becomes more distinct, and the socket commences to inclose it, the germ itself becomes more apparent, and accommodating itself to its receptacle, begins to assume the form of a future tooth. Towards the fifth month, advancing in their development in a lateral position, are to be distinguished, two or three red indurated points, in the upper part of the germs of the incisors. These speedily unite, and form a sort of bifurcation, which the incisors still exhibit on their first appearance. At

a later stage, a similar point is seen on the top of the follicle of the canine, and several of them on that of the anterior molar.

To these primitive indurated points, quickly succeed small single scales for the incisors and canine teeth, multiplicous and distinct for the first molar. The scales already possess an osseous structure, and in progressively enlarging, form a covering to the pulp, which they envelope, and to which they firmly adhere. They would seem to be the product of a secretion from the surface of the dental germ; and very soon this ossification advances from above downwards. When it assumes the form of the corona of the tooth, a circular depression is observed below, which it contracts and elongates, to constitute the fang. As it is on the external surface of the germ that ossification is going on, hence it takes place from within outwards, so that the osseous shell contains the pulp or germ, and is enveloped by the double membrane which constitutes the wall of the dental follicle. The internal membrane being immediately applied to the point of ossification, is supposed to secrete the enamel of the tooth. The outer shell, as far as the cervix, is the enamel; it is remarkably dense, and differs materially from the rest of the tooth.

Thus, simultaneously, the ossification of the jaws, and the development of the teeth proceed during uterine life. After birth, their disposition, shape, and progress, would seem to be regulated by the growth of the maxillæ, and the changes experienced by the dental grooves; as is supported by the fact, that sockets are earlier formed in a distinct way, and that the teeth sooner protrude the gum, in the lower, than in the superior maxilla. The penetration of the gums by the teeth, is a mechanical action, occasioned by their evolution, and the concomitant development of the jaws. Except the ossific points of the canine rudiments, those of all the others are upon the same level, and do not, until birth, project beyond the margins of the maxillary furrow. The lower extremity of the germ is not ossified; it continues at this point soft and transparent; and the osseous shell seems to be supported at the upper part of the maxillary groove, by its adhesion with the alveolar periosteum of the inferior margin of the gum. The structure of the gum is firm, solid, somewhat like cartilage; it exhibits in those places where the teeth are lodged, an edge for grinding, until the teeth appear. This border of the gum sometimes displays eminences and depressions corresponding to the teeth, and to the hollows which separate them.

After birth the gum becomes softer, effacing gradually the grinding edge, presents rather a depressed surface, and only swells when affected with inflammation. When the cervix of the tooth assumes a determinate form, its radix elongates and reaches the bottom of its socket. Ossification being progressive in the maxilla, it expands and embraces the fang, betwixt which and the bottom of its socket, there remains but a small space occupied by the pulp, which has been pressed down through the cavity of the cervix, to form a mould for the fang. When the tooth has more than one radix, the interior of the cervix is intersected by partitions, which divide the pulp in its passage into the required number of pedicles. As the enamel is perfected, and the tooth acquires its full elevation in the jaw, its membranous envelopment becomes less vascular and more attenuated, and by absorption is at last destroyed. After birth the two sockets of the incisors are not upon the same plane; but in the fourth month, the difference is more marked. From the level of the median line, the lower jaw makes rapid progress in height and thickness, and elevates with it the first incisor, which gradually pierces the gum. From the sixth to the eighth or ninth month, the two central incisors of the lower jaw penetrate the gum; and in a month or more thereafter those of the upper maxilla. The lateral, from their sockets being a little deeper, are slower in advancing. And the canine, from being more deeply implanted, locked, and situated obliquely in their contracted sockets, require a slight increase of the dental arch, and an advance of the process of ossification in the maxilla, that they may reach the bottom of their deep sockets, a supporting point necessary to their advancement from below upwards. The anterior molares, whose ossification commences early, and which are generally more superficial than the cuspidati, appear sooner than them: in the lower jaw, they succeed the lateral incisors, between the twelfth and fourteenth month. The protrusion of the canine takes place after the eighteenth month; and the posterior grinders on each side below, and thereafter those above, complete within the third year, the inferior and superior dental arches, each of which, as might be remarked, consists of ten teeth.

From the foregoing observations, it appears, *first*, that the development of the teeth regularly follows the progress of ossification in the jaws; *secondly*, that their protrusion through the gums results, on the one hand, from their own evolution, and on the other, from the increased ossification and size of their sockets; and, *thirdly*, that the cause of their

evolution in the order we have mentioned, is altogether mechanical, and arises from the celerity or tardiness with which the socket proper to each is formed, and the depth to which each tooth is implanted in the jaw.

Much irregularity is observed in the protrusion of these organs; some children are born with an incisor or two; but generally their implantation is so superficial that they soon drop out; and if, during sucking, they injure the nipple, they should be extracted. The teeth seldom vary in number, except when the temporary ones are not detached at the usual period, when a double row may be seen. In their position, the irregularities are more frequent, and always the result of malformation of the superior, or inferior alveolar arches. If the socket, whose shape generally regulates the growth of the tooth, cannot, from the maxilla not having acquired its proper growth, be freely formed, we may readily conceive that the tooth will be influenced by this deviation; it may not be in the same line with the others, nor in the dental arch at all. In some instances there never are any teeth. If, during the development of the jaws, the alveolar partitions are arrested in their formation, or the maxillary grooves continue open throughout their whole extent, the dental germs remaining grouped and adherent, the teeth which are to succeed them will themselves cohere, and constitute a single mass, composed of several teeth adhering by their corona, or by their fangs.

After the third year, the deciduous teeth *begin* to decay; and at different periods thereafter until the seventh, are dislodged by the permanent, which are more numerous, durable, and firmly fixed, than the preceding. In resemblance to the fang of the tooth, the first generate the second set, from a niche which in time constitutes their socket. On the posterior aspect of the temporary teeth, is given off a process that projects backwards, and constitutes the origin of the permanent. We have also in each jaw the rudiments of the first immutable grinder, which, as the maxilla lengthens, presents the peculiarity of generating the second, and this last, the third of the same kind.

Few children cut the deciduous teeth without more or less suffering. Those reared in town are generally more indisposed than such as reside in the country; in the winter months, the symptoms are more severe than in those of summer; in subjects imperfectly nursed, than those who have been properly reared; in weakly than in strong infants; and in some families, male children suffer more than females. Dentition is known to be approaching by occasional fretful-

ness, and paroxysms of fever; disinclination to food; sometimes drowsiness, diarrhœa, or vomiting. The mouth becomes hot, the saliva very copious, the gums broader, and the infant starts during sleep. Numerous and formidable diseases may be superinduced by the irritation of teething. These, by proper attention, may be greatly obviated. The principal points to which the practitioner will require to direct his attention are, allaying local irritation, regulating the diet, and, under protracted suffering and debility, supporting the system. The mode of fulfilling these intentions has so often already been laid down, in many of the subjects discussed, that any further repetition of it would be superfluous.

Remittent Fever.—This affection attacks children indiscriminately; but among the poor it is more prevalent perhaps, than those in comfortable circumstances. Its exciting causes are numerous; in short, it may be occasioned by whatever produces irritation of the stomach and bowels; but the principal of these are impure or superabundant nourishment, and neglect of personal cleanliness. It may often be traced to delicacy, induced by too early weaning, protracted nursing, and especially to the milk of a woman who menstruates; and among the higher orders it not unfrequently arises from this secretion being vitiated by irregularities. Sometimes it is owing to children being indulged in food whenever they cry for it, or become fretful. Among the poor, from the skin being frequently neglected, we may have congestion of the liver, or of some other abdominal viscus, probably some portion of the intestinal canal, whereby a foundation is laid for the disease. There is no cause of more assured influence than torpor of the liver; and we may add, the irritation of teething and worms, and the effects of a damp residence and impure air. With the proximate cause we are unacquainted, for few opportunities occur of determining this by autopsy. The late Dr Armstrong, who has given the most rational view of it, observed, that frequently it was to be ascribed to inflammation of the mucous membrane of the stomach, or some portion of the intestines. I am well assured, that the liver also is implicated; that the morbid state for some time consists simply in high irritation of these organs; and that, when it amounts to inflammation, it verges more to the chronic than the acute kind. Except the intermissions, which often are certainly well marked, there is nothing in this but what may be observed in common fevers.

The first symptoms are, a variable appetite, headache, with peevishness, and excited circulation as the day advances: the pulse is rarely under ninety, frequently above it; but

in the fore part of the day there is some degree of cheerfulness, and nearly total freedom from fever. In the forenoon, the child eats tolerably, or even greedily; but thereafter, there is not only no appetite, but even a dislike to food which was at one time much relished. The tongue is either furred or very red; there is always some degree of bronchitis; the palms of the hands and soles of the feet are constantly warmer than usual, and become very hot in the evening. Frequently, the stomach is irritable, and rejects its contents; and the excreta also have a morbid appearance, being at first constipated, but as the disease advances, becoming loose, pale, inclining to light yellow, clayey, dark green, and very fœtid: the abdomen is tumid, and pain therein is a common ailment. The urine is inconstant. Atrophy and flabbiness of the soft parts succeed, with a straw-coloured, squalid appearance of countenance, and tabid skin. During sleep, the breathing is hurried; and when the disease has long continued, œdema and paralysis of the pelvic limbs are not uncommon; but the latter is transitory. A satisfactory diagnostic in this affection is, the distinct remission from fever, which may continue from twelve to forty-eight hours. The disease may persist from two to six weeks, and is rarely fatal; it may, however, end in hydrocephalus, or tabes mesenterica.

The best treatment is the judicious use of mild laxatives, as Rhubarb, Senna, Compound Jalap, occasionally Calomel, and Castor Oil when it does not derange the stomach. Small doses Submur. Hyd., followed up, in an hour or two afterwards, by some mild aperient, are exceedingly useful. If we are called in an early stage, and if the child has stamina, a few leeches to the stomach or umbilicus will be found very beneficial; or if there be drowsiness, starting, or much talking during sleep, blood should be abstracted from the back of the neck. The gums must be examined, and scarified at such points as are inflamed, even though teeth be not near. We should ascertain whether the skin be neglected, and insist on its ablution with tepid water morning and evening. A country residence has often an excellent effect. The child should be allowed nothing more nutritious than milk, until convalescence is established; and that unscientific system, of giving tonics and stimuli during the intermission, should be reprobated. Encasing the body in flannel is highly useful.

CHAPTER VIII.

DISEASES OF THE ORGANS OF SENSE.

Ophthalmia.—This disease is rather frequent among infants, and generally commences before the fifth day after birth. One eye is first affected, and soon afterwards the other. At the commencement, the organs are observed to secrete more than usual, and this is followed by swelling of the lids, which in two or three days become so much affected, that the ball of the eye cannot be uncovered. The inflammation is limited to the conjunctiva. A variety of causes has been assigned for this complaint, as the presence of leucorrhœa at the time of delivery, also of gonorrhœa, exposure to cold, to a strong light, or to a large fire, and to the infant rubbing the eyes in his sleep, or while awaking from it. To leucorrhœa, I have never been able to trace the complaint; but the influence of the other causes is often too obvious to admit of doubt. When the swelling of the palpebræ is considerable, this affection has an alarming appearance; but when judiciously managed, it neither continues long nor proves troublesome. Every time the eyes are inundated with matter, which generally flows from them in profusion, equal parts of milk and water, in a tepid state, should be allowed to fall on them. It is seldom that any other remedy is required until the swelling of the eye-lids subsides, which, in most cases, happens in a week, when a solution of one grain Sulph. Zinci, in ℥j of water, may be used in the same manner as the tepid milk and water.

Occasionally the eye-lids are everted, and the inflammatory action extends to the subjacent tunics. Ulcerations and opacities may form on the cornea, and the eye sometimes bursts. The disease rarely proceeds thus far in infants. When the patient seems uneasy, when there is unusual heat in the forehead and temples, and the swelling persists, a leech must be applied to the root of the nose, or to the forehead, and its effusion regulated according to the vigour of the child. The eyes must be fomented with a warm decoction of Poppyheads, and a laxative administered every alternate day. Great care must be observed not to suffer the secretion to accumulate for any length of time under the lids. It should be removed in the simple manner pointed out, or by means of a syringe. Besides an astringent wash, when the secretion continues long profuse after a severe attack, the size of a coriander seed of an ointment, composed of ℥j. Adip. Suill., and 12 grs.

Ox. Hyd. Rub. should be introduced, night and morning, betwixt the eye-lids.

Psorophthalmia.—This consists in chronic inflammation of the eye-lids, which are red, tumid, and covered with viscid matter. In time, the ciliæ drop out from ulceration of their bulbs; the patient complains of a sensation of sand in the organs, both of which are almost always involved. The inner surface of the lids is inflamed; at last the cornea is similarly affected; and sometimes ulcers form on the latter, by which vision may be injured or destroyed. Generally this affection indicates a strumous diathesis; and it may be excited by the exanthemata, the desiccation of ulcers behind the ears, or disordered alimentary canal. From syphilis it is to be distinguished by the history of the case. In most instances, it is an obstinate complaint. A cure is to be attempted by the external and internal use of Iodine, the regulation of diet and of the bowels, blisters occasionally applied on the back of the neck, and sea-bathing. Every night at bed-time, the viscid matter on the lids should be completely removed by Sol. Hydriod. Potass. and then smeared by Ungt. Hydriod. Potass., Ungt. Nit. Hyd. Mit., or Ungt. Ox. Hyd. Rub. The same process must be gone through in the morning. When the eye is irritable, a few drops Vin. Opii, or Tinct. Opii, may be allowed to fall into it daily. A dark shade should be constantly worn.

Leucoma.—Specks frequently form on the cornea from previous inflammation; and as they often obstruct vision, their removal must be accomplished. Dropping a little powdered refined sugar, Calomel, Sol. Argent. Nitrat., or Aq. Cupri Ammon. into the eye, will all be found useful. In time, slight opacities disappear without any remedy. *Ulcers on the cornea* may also be cured by either of the above solutions.

Coryza or Snuffles.—This affection, which is also termed snivels, is frequently observed among infants, at birth, or a few days thereafter. It is more unpleasant than dangerous, and consists in inflammation of the mucous lining of the nares. The principal feature of the complaint is the noise which the child makes when he breathes through the nostrils, owing to these canals becoming somewhat contracted, from thickening of their lining membrane. The only cause that can be assigned for it is exposure to cold; the infant, probably, while in bed, and in a state of perspiration, being suddenly exposed to a current of cold air, or taken into a cold apartment, and a sudden check being thus given to the flow on the face, and inflammation of the lining of the nares produced. In ordinary cases there is nothing required except

warmth. One or two drops of warm olive oil should be allowed to fall into each nostril, morning and evening, these passages being previously cleared out, by throwing a little warm water into them by means of a syringe. While the infant is asleep, his face should be freely exposed, and his arms so secured as to prevent him dragging the clothes over the head, as this, of itself, is often the cause of the countenance being imbued with perspiration. Placing on the nose and forehead, repeatedly in the day, a compress of soft linen, immersed in warm water, has a good effect. Unless the complaint be early attacked, it will persist for a length of time, in defiance of every remedy. In its chronic state, a little Ol. Ammon., applied by means of a feather on the outer surface of the nose, and over the forehead is beneficial; as also the Vin. Opii, used in a similar manner.

Otalgia.—This is the term applied to inflammation of the external ear. Frequently, where the suppuration has formerly taken place, the organ is suddenly affected with excessive pain, unaccompanied, as far as inspection can determine, by a vestige of excitement; in many instances, the uneasiness would seem neuralgic. When inflammation is present, however, it may seize the concha, and the whole meatus auditorius externus. Both ears are rarely simultaneously affected; the lining membrane is red and tumid, suppuration takes place in a night, relief follows, and generally, the discharge soon ceases. The pain is characterised by becoming, not progressively, but suddenly violent; ceasing and returning abruptly; attended, when severe, with uneasiness and redness of the eyes, darting sensations in the cheeks and temples, with confusion of sounds in the ear, which is evidently tumid, pulsates, and is attended with a sense of weight. The sufferings of the patient are most excruciating, but the complaint is not dangerous. Until after puberty, one attack paves the way for another from the slightest cause. Excessive pain in this sensitive organ may be produced by any foreign body entering it, indurated wax, blows, ulceration of its lining, caries of the ossicula, inflammation of the fauces, toothache, rheumatism, or cutaneous diseases, but the most frequent of any, is exposure to cold. When early noticed, relief is speedily obtained, by leeches and warm cataplasms; but where the disease has not been attacked *in limine*, small blisters behind the affected organ will afford more immediate benefit. When suppuration takes place, the ear must be syringed frequently each day with water as warm as the patient can support its use; and this is the more necessary when there is much irritation, or when the presence of indu-

rated wax is suspected. If the discharge still persist, some mild astringent fluid, as Decoct. Querc. Robor., or Sol. Sulph. Alum., in a tepid state, should be used. When the pain returns in paroxysms, subsides abruptly, and seems to be spasmodic, or neuralgic, unaccompanied by inflammation, it may be speedily relieved by introducing into the ear, on a bit of cotton, a little Tinct. Opii., or of some essential oil diluted with spirits, as that of Peppermint.

Otitis.—Inflammation of the internal ear may either be an extension of the preceding variety, or commence originally in the internal cavity, in consequence of the application of one or other of the causes specified under the head of otalgia. The inflammation may be seated in the lining of the tympanal cavity, in that of the mastoid cells, or in the connecting membrane of the ossicula. This is a most formidable affection, for unless it receive timely attention, the whole inner cavity may be involved, suppuration ensue, the tympanum be destroyed, and the small bones thereafter drop away. In this variety, the uneasiness is more diffuse, constant, and gravitative, but less acute than when the external ear is affected. This is rather a familiar sequela of rubeola, and scarlatina, in strumous subjects. The same remedies are required here as in otalgia; but their application must be more prompt and energetic.

Otorrhœa Purulenta.—This is the term applied to protracted discharges from the ear; and as would readily be inferred, the matter may be derived from the external or internal organ. If from the former, and it continue long, the tympanum is sooner or later destroyed, and its cavity and containing organs are involved. The same effects happen more speedily, when the excitement commences in the internal organ; through time the temporal bone becomes carious, the function of the ear is lost; or the membranes of the brain even may be effected. The discharge, at first yellow, and possessing little odour, gradually becomes darker, and excessively fœtid. When an abscess is forming in the tympanal cavity, the angle betwixt the ear, maxilla, and the neck, is filled up by tumefaction, and whenever matter can be felt, the teguments should be incised over the mastoid process. These cases are exceedingly untractable, and by no means free from danger, from the cerebral tunics being apt to suffer.

Otorrhœa Mucosa.—In some cases a preternatural secretion of wax would seem habitual. This I have seen in all the progeny of two families, the female parent being similarly affected. Such a state may continue in some instances, for

a long series of years, or indeed for life, without injuring any function except that of hearing, which in such cases, is almost always less acute. In otorrhœa, dependent on a scrofulous diathesis, whether purulent or mucous, I can speak with confidence of the good effects of the external and internal use of Iodine. The most scrupulous attention must be observed to keep the ear clean, by injecting into it a diluted solution of this last drug. The practitioner must carefully avoid abruptly suppressing the discharge, lest meningitis might follow. A seton in the neck, tonics, with sea bathing and country air, are useful; and warm clothing in cold weather.

CHAPTER IX.

DISEASES OF THE URINARY ORGANS.

Suppression of Urine.—Here there may be no urine secreted, or if elaborated, it is not transferred into the bladder. To this state we may, with propriety, in many instances, apply the term suppression. It may arise from spasm, calculous concretions, and inflammation or abscess of the kidney, its pelvis, or the ureters, whereby the urine when secreted, is obstructed in its course. In very young subjects, suppression generally terminates quickly, from the effects of local inflammation, or encephalic effusion. When only one kidney or ureter, is diseased, the case may be protracted, from those of the opposite side performing the office of both. In this affection, from the secretion passing off by the skin, perspiration as well as the exhalations from other outlets, possess an urinous odour; moreover, ureteric obstruction is accompanied by a sense of weight and numbness in either thigh, with retraction of the corresponding testis, and if both the canals be affected, absence of urine in the bladder, which also happens when each kidney is diseased. It is scarcely necessary to state, that this is a very dangerous disease, especially in young persons. The only practice that can serve any purpose, is local bleeding, blisters, warm bath, and enemata.

Ischuria.—Retention of urine may arise from pressure on the neck of the bladder, from some mechanical cause, as distended rectum, inflammation, spasm, the irritation of calculus or piles, paralysis, over-distension of the vesical fibres, long retention of urine, or some obstruction in the urethra. In this case, the hypogastrium is tense and painful, and there

are frequent, but abortive attempts at micturition. If this state be suffered to continue long, a portion of the urine may be absorbed, and thrown off in some internal cavity, as the head; but this rarely happens. More frequently, however, the bladder itself suffers from inflammation and its consequences; but sometimes several days may elapse without any injury being induced. In the treatment, we must be regulated by the causes. Relief may be obtained by local bleeding, warm bath, fomentations, and opiate enemata; or if these should fail, the catheter must be tried; and if this does not succeed, and the patient be *young*, the bladder must be punctured above the pubes.

Dysuria.—Difficult micturition is a common complaint, either during temporary or permanent dentition, owing to spasm of the spincter vesicæ, arising from the sympathy betwixt the bladder and the bowels, which are often similarly affected at this time; and the complaint is more common in boys than girls. The infant shrieks violently when he attempts to evacuate the bladder; the hypogastrium is tense and painful on pressure; and inflammation, with all its unpleasant consequences, may supervene, unless the case receive early attention; but when timely assistance has been afforded, the child soon assumes his wonted cheerfulness. Relief may be obtained by the submersion of the nates in warm water, an enema, a few drops Tinct. Opii. and Æther. Nit. and in older children, the introduction of Opium into the rectum. Tinct. Opii. Camph. and Tinct. Hyosc., are useful.

Incontinence of Urine.—This disgusting habit is generally owing, in the first instance, to neglect on the part of the nurse. It may also arise from relaxation and paralysis of the bladder, and its sphincter; in which case there is pallid countenance, languor, inactivity, emaciation, and impaired digestion. In some persons, the urine escapes while they are awake, in the day time, as well as asleep in the night: and during childhood the complaint has been known to cease, yet return at puberty. It is oftener observed in females than in males. When this malpractice is the result of indolence, the individual should be allowed no liquids after the middle of the day; he should be sent to bed without supper; use a hard mattress and lie on his side; and be repeatedly wakened during the night. If it depend on relaxation, the system must be invigorated by cold bath and other tonics.

CHAPTER X.

DISEASES OF THE SEXUAL ORGANS.

Swelling of the Breasts.—This may be met with in infants of either sex. I am at a loss to account for it. Does it arise from any degree of pressure to which the chest may be exposed in its transit through the brim of the pelvis? Gentle frictions, with warm olive oil, sometimes cause the swelling to recede; at other times, the breasts suppurate; and then warm cataplasms must be applied. The swelling recedes entirely, or matures within a week from its first appearance. The abscess bursts, and cicatrization soon takes place.

Ulceration of the Pudendum.—This disease attacks children from one to six years old, and commences by chilliness, slight headache, thirst, nausea, lassitude, impaired appetite, listlessness, coated tongue, torpid bowels, and pain in voiding urine. These symptoms precede, by two or three days, the appearance of disease in the genitals. The urinary derangement leads to an inspection of the vulva, when one or both labia, and all the external genitals, are found more or less enlarged, pervaded by an inflammatory dark tint, and accompanied by a thin secretion from the passages. The disease is so rapid in its progress, that scarcely twenty-four hours elapse, when numerous small vesications form within the labia, which coalesce and degenerate into ulcers that discharge a dark-coloured, peculiarly offensive matter, which promotes the extension of ulceration over the neighbouring parts, even to the top of the thighs, perinæum, and anus. In this stage there is prostration of strength, quick pulse, pallid countenance, while the stools are dark, slimy, and offensive; and as ulceration advances, the circulation is enfeebled, the face becomes paler, and the bowels are relaxed. The duration of fatal cases is various, and cannot well be decided; but when recovery takes place, the disease may continue from two to three weeks; and even then, the debility and mucous discharge do not subside. Mortification is a rare termination. This affection is extremely formidable, and is generally confined to children breathing an impure atmosphere. We must avoid confounding it with injuries supposed to arise from attempts at sexual connection. The best treatment at the commencement is the reiterated use of warm emollient poultices, or opiate fomentations, and baths of blood heat, with occasional mild laxatives. Infus. Anthem. Nobil. in a tepid state, is to be fre-

quently injected upon the vulva, to prevent the morbid secretion lodging around the parts. After ulcers have formed, the fermenting poultice, or one composed of decayed pears, or apples warmed, will be found a most useful application; and the margins of the ulcers are to be touched morning and evening with Argent. Nit., or they may be covered with some stimulating ointment. When the acute symptoms have subsided, tonics, nourishing diet, and country air should be recommended.

Leucorrhœa.—I have seen this affection in infants contaminated with syphilis; but more frequently in cases where the young patient was entirely free from this virus. In many examples, it may arise from sympathy between the vagina and the mucous coat of the intestines, in a state of irritation; in other examples, from exposure to cold, some mechanical irritation applied to the sexual canal, or from worms passing into it from the rectum. It is more alarming in appearance than dangerous. Nothing more is required in the treatment than warm clothing, cleanliness, and an occasional dose of some mild laxative. When importuned by the parents, a little tepid water, or tepid decoction of oak bark, may be thrown into the vagina three or four times daily, by a syringe; or if the complaint depend on the presence of ascarides, these are to be destroyed.

Hydrocele.—In two or three days after birth, we occasionally observe an effusion in the scrotum; and sometimes, though rarely, the cellular tissue is infiltrated to the extremity of the penis. Though, generally speaking, I believe this effusion to arise from mismanagement on the part of the nurse, yet, in a few instances, I have been led to remark, that it was connected with a state of general delicacy. When ablution of these organs is not conducted with tenderness, a slight injury may be followed by effusion. The object of the practitioner is to be able to convince the friends, that this affection is free from danger. Except where it is connected with constitutional weakness, the effusion is rapidly absorbed. A suspensory bandage, and a compress immersed in a solution of the Sulphate of Zinc, of moderate strength, will be adequate to its removal. In obstinate chronic examples, the application must be rendered stimulating by the addition of a fourth part of proof spirits; or one part of Acid Acet., and three of water, may be used instead of the Sulph. Zinc. The practice of puncturing the hydrocele with a common needle has been pursued in many cases with perfect success; it probably acts by inducing irritation, which causes absorption of the fluid, as the quantity

that exudes through the minute puncture, is not sufficient to produce any appreciable change in the bulk of the tumour. All irritation of these organs must be avoided, on which account the napkins should be changed whenever they become wet.

CHAPTER XI.

RACHITIS.

This complaint is oftener noticed in cold than warm regions, in the children of the poor than those of the affluent, and of the young reared in town than such as are brought up in the country. It may commence at any time during the growing period. General debility, and functional derangement of the mesenteric glands, predispose to it. When the nutrient properties of the food are not transferred by the latter organs into the circulating mass, the osseous system becomes deficient in phosphate of lime, and rachitis is induced; or if the supply of nourishment be defective, either in quality or quantity, the disease may equally arise. Rachitis may be owing to a child having been reared on the milk of a woman who menstruated regularly during nursing; or who, during lactation, had suffered much from the depressing passions. From this brief view, the exciting causes will be anticipated; but of the whole, unwholesome nourishment, breathing an impure atmosphere, and inattention to personal cleanliness, are the principal. The disease consists in softness or want of solidity of the bones, from a deficiency of phosphate of lime. The whole osseous structure of the body, with few exceptions, may be more or less affected in its symmetry; but the long bones and the spinal column are the most subject to deformity. Among the symptoms, disproportion betwixt the head and the trunk, and between the bulk of the joints, and the thickness of their connecting bones, flaccidity of the soft parts, and attenuation of the muscles, may be mentioned. The pulse is feeble and accelerated, the appetite seldom fails, but digestion is ill performed; the stools are torpid, and possess a fœtid odour. To these succeed, incurvation of the spine and long bones, and inability to walk. The carotids and jugulars swell, the sutures of the cranium become visible, and the anterior fontanelle is long of closing. There is a liveliness of countenance, premature development of intellect, a rising of the sternum into a point, and depres-

sion of the ribs on one or both sides. The evolution of the teeth is tardy, and they soon decay. After having continued for some time, the disease is suspended, and the patient recovers, but continues deformed for life. In other cases, where the disease is dependent on scrofulous diathesis, the child becomes emaciated, and falls a victim to tabes, hectic, and debility. *On dissection*, we find the muscles pale and flaccid, the liver indurated, the mesenteric glands enlarged and hardened, the bones spongy, and sometimes water between the dura mater, and tunica arachnoidea.

In the treatment, we have, *first*, to improve the chylopoietic organs; *secondly*, to obviate deformities; and, *thirdly*, to infuse vigour into the system. To answer the *first* object, an *alterative* course of mild aperients is to be directed, with which frictions with the Tinct. Sapon. c. Opio., or Tinct. Camphoræ, over the abdomen and the distorted points, with a mild nutritious, but an abstemious diet, and the exhibition of tonic bitters, and preparations of Iron, are to be conjoined; along with the latter, Ol. Jec. Asel. is much used by Continental practitioners. The remedies required to fulfil the *second* indication, are mechanical contrivances to support the debilitated parts. Their construction will readily suggest themselves to any person of ingenuity, and they are now so generally on sale, in every possible shape and variety, by those whose business it is to manufacture them, that they need not be described here. Many practitioners are accustomed to keep their patients, for a long period, almost constantly in the recumbent posture; but no person was ever cured of debility by this plan; wherefore, in all cases where the patient has sufficient vigour, exercise to a *moderate* extent in the open air, will be found highly advantageous, alternated with rest in the recumbent posture. Where mere children are affected, they should be encouraged to toss or creep upon a carpet, in a dry open situation. Riding the rocking horse may be considered excellent exercise for those sufficiently old. The head should be covered with a cap, which shall fit it closely; or it ought to be surrounded by a roller, to impede its enlargement. In the employment of mechanical means, no contrivance is to be used that is likely to constrain the part; it ought simply to convey a feeling of support. To fulfil the *third* indication, besides exercise, we recommend tonic medicines, as a vinous effusion of Quinine, Tinct. Cinnam., Ox. Zinc., or Sulph. Ferri, cold bath, flannel clothing, and a mild nutritious diet.

CHAPTER XII.

SCROFULA.

This is as certainly an acquired, as it is an inherent disease; but the latter more frequently than the former. It may appear at any period from infancy to puberty, but rarely afterwards. Scrofula, phthisis, and mania, are sometimes developed in members of the same family. In an infant fifteen weeks old, affected with struma in the right thumb, in the practice of the author, the grandfather committed suicide by precipitating himself over the walls of a fortress, and the grandmother by dividing the larynx: the mother of the child died while affected with puerperal mania; and the father is decidedly strumous. The subjects of this disease are characterized by certain peculiarities of countenance, and of structure. The skin is thin, the countenance full and rosy, from the vessels being so superficially seated, the hair is fine and light coloured; the eye-lashes long, the lids thickened, and the pupils dilated; the upper lip tume fied; and the fingers are long, thin, broad, and flat at their extremities. The blood coagulates less firmly, and the proportion of serum is more abundant than in other subjects. The parts which the disease most frequently attacks are the absorbent glands, and the joints. Of the former, those of the neck and the mesentery are the most liable; and of the latter, all may be affected at different times in the same person, except those of the toes, in which the author has never seen it; that of the hip-joint is a variety of scrofula, by far the most formidable. Strumous diseases are generally indolent but inflammatory, and undergo all the different processes of this latter action, as adhesion, suppuration, ulceration, and gangrene. A marked characteristic of the disease, is to suppurate and cicatrize very tardily, to generate much fungus, and to leave scars which are almost indelible. Individuals affected with this malady, exhibit a premature development of intellect, and an amiability and liveliness of manner. The predisposing causes are general delicacy, and hereditary tendency. It may be induced, however, in habits nearly free from every taint of the kind, by frequent mental agitation on the part of the mother, either during gestation or nursing; early indulgence in stimuli, improper food, want of warm clothing, of personal cleanliness, and a damp ill-ventilated residence. It is much more prevalent in low, damp, cold countries, than under opposite circumstances;

and in children of the poor, than in those of affluence. In most instances, after an extremely tedious process, the sores cicatrize, and the patient recovers; but frequently, at some future period, he falls a victim to phthisis. *Autopsies* discover extreme attenuation of the muscles, and of the cellular membrane; flaccidity of the heart and arteries, which latter can scarcely be injected without rupturing them. The stomach and intestines are thin and pellucid, the absorbent glands enlarged, and those of secretion flaccid.

In the *treatment* of scrofula, we have obviously three indications to fulfil; *first*, to prevent the appearance of the disease; *secondly*, to invigorate the system; and, *thirdly*, to promote the discussion of glandular swellings, and the cicatrization of ulcers. To accomplish the first, if the mother be strumous, she must be dissuaded from nursing; and the child must be reared in the country by a healthy woman; warmly clothed, and in winter bathed in tepid, instead of cold water, as also when he is suffering from indisposition, however trifling; in summer, the cold plunge bath is preferable, if he be in health; milk diet ought to be the only support until the deciduous teeth have all appeared. The gums are to be frequently examined, and scarified when necessary, to prevent the irritation of teething exciting the germs of the disease. We fulfil the second indication by the use of tonics, exercise in the open air, cold bathing during the proper season, regular hours for rest and nourishment, and a generous but digestible diet. To meet the third indication, we trust, in the *first* place, to the external and internal use of Iodine, of the great utility of which the author can speak with much confidence; to fulfil the same indication, Cod Liver Oil, which contains Iodine, has been recommended, but from what I have seen of its use in various forms of scrofula, it does not appear to merit the implicit confidence with which some practitioners regard it—and with this we conjoin frictions for the discussion of the swellings; and for the ulcers, stimulating dressing, which should be frequently changed, for some others. Whenever in a tumour, matter can be distinguished, it should have exit, that cicatrization may not be retarded by loss of tone. In affections of the spine, blisters, issues, and moxas, are the most useful remedies. For the *internal use* of Iodine to adults, the author directs the following formula, Iod. ℈j., Hydriod. Potass ℈ij., Aq. Distil. ℥vii. Dose, six drops early in the morning, and an hour before dinner, in half a wine glass of water, sweetened with sugar. Two drops should be added every week, till the daily dose amounts to thirty-six drops. For children under

seven years of age, two drops, gradually increased to five, twice a-day; and between the age of seven and fourteen, from five to sixteen drops per diem. To patients who are averse to the foregoing solutions, the author exhibits Iodine in the form of tincture, commencing in doses of seven drops three times daily, to adults; and increasing the quantity very progressively to twenty-one drops in twenty-four hours. As an *ointment* the following formula may be used; Iod. gr. xii., Hydriod. Potass, ℈iv., Adip. Suill. ℥ij. A *solution* of this agent for external use may be prepared as follows: Iod. gr. ij. Hydriod. Potass, gr. iv., Aq. Distil. ℥xvj. Its strength may be increased to three or to four grains of the Iodine; and to six or eight of the Hydriod. of Potass. It is used in coryza, ozena, fistulæ, &c. by means of an ivory syringe. As a *rubefacient* the following preparation may be employed; Iod. ℈iv., Hydriod. Potass, ℥j., Aq. Distill. ℥vj. It is applied by means of lint, to surfaces requiring stimulation: in chronic ophthalmia, coryza, ozena: in baths and poultices. The baths should be prepared in a wooden box, to avoid decomposition. The hands, chin, feet, &c. may be inserted. The quantity of the solution necessary to be added to the warm water, to be determined by the patient's feelings. *Iodu-retted cataplasms* are prepared from the common materials, together with the above rubefacient solution, and are good in cold abscesses, and hard tubercular tumours. Where the solution and the ointment have failed, the following concentrated preparation applied, Iod. ℥ss. Hydriod. Potass, ℥j., Aq. Distill. ℨij. twice a-week to the eye-lids, and to the nasal fosæ, to repress excessive granulations, will be found of great utility. An *eye solution* may be composed as follows: Tinct. Iod. gt. xxx., Tinct. Opii. gt. xxvj., Distilled Water, four ounces. A plaster containing this agent may be formed as follows; Emplast. Litharg. ℈ij, Pulv. Iod. ℥ss, Hydriod. Potass, ℈ij, Extract. Opii. ℥ss. It is applied to the parotid, and other glands, when enlarged.

CHAPTER XIII.

CONTINUED FEVER.

Except when epidemic, this affection is very rare in children; nor, in most instances, can we distinguish it unless prevailing under this type, from fevers produced by common causes. I have seen subjects, children three years old affect-

ed. Typhus is suspected by the disease being prevalent, the child being drowsy, disinclined to leave his bed at the usual hour, to take food, or to enter into the amusements of other children. He is fretful if merely spoken to, lounges about on chairs or sofas, or he is observed to sit unusually close by the fire: the face is pale, eye dull, irritable, suffused and imbued with tears; and the tongue is loaded. If old enough to describe his complaints, headache, pains in the knees, and chilliness, are complained of; but still the skin is hot, and the pulse is frequent. Some degree of bronchitis is almost constantly present. The bowels are generally torpid, the stools very fœtid, and the urine loaded. To this class of patients, the disease is rarely fatal; but it may terminate in this way by exhaustion, and often by hydrocephalus. In all cases, whether there be headache or not, it is a very proper precaution, to leech the temples, or the back of the neck. When there is obvious cerebral derangement, venesection should be preferred where the subject is old enough. *Secondly*, mild laxatives are to be in constant use. *Thirdly*, we moderate the fever by saline Juleps, combined with Antimonial Wine, sponging the body with tepid water, frequent changes of linen, and freely ventilating the apartment. *Fourthly*, the bronchitis must be relieved by demulcents, a few leeches, or a small blister on the chest. And, *lastly*, until after convalescence, milk and water, or milk whey, will constitute the most eligible articles for drink and nourishment.

ADDENDA ET CORRIGENDA.

Page 76, first line, for "208," read "108."
Same page, for "Hofackner," read "Hofacker."
Page 102, line 28th, dele "and chorion."
.... 29th, for "cover" read "covers."
Page 338, first line, after "labour," add "cannot."

Porrigo Decalvans.—Baldness, unaccompanied by tinea, is of rare occurrence in children. It was thought to depend on defective nutrition of the hair bulbs; but the recent investigations of Gruby have shown, that the disease is caused by the growth of parasitic fungi within the hair bulbs. Local application of warm animal oils, and oily aromatic essences, together with attention to the general health, have been found the most useful remedies.

Figures 1 *and* 2. *Diagrams to illustrate the formation of the Amnion, Allantois, and Umbilical Vesicle of the Chick, after Wagner.*

a Dorsal structures of the embryo.
b b Outer layer of the germinal membrane.
c c Inner layer of the germinal membrane.
d d Portions of the outer layer of the germinal membrane rising over the embryo to form the amnion, which, in fig. 2, is seen completed.
e e Cavity of the amnion.
g Organic cavity of the embryo.
k Communication between the organic cavity of the embryo and the umbilical vesicle; in fig. 2 it is contracted, and then receives the name of ductus vitellinus or pedicle of the umbilical vesicle.
m m The cavity of the yolk sac, or umbilical vesicle.
n The allantois.
o In fig. 2, the pedicle of the allantois or urachus.

Fig. 3. *Diagram to show the arrangement of the Decidua in the Human Female, after Wagner.*

1 A plug of mucus in the cervix uteri.
2 Opening of one Fallopian tube.
3 The decidua vera.
4 The cavity of the uterus nearly filled by the ovum.
5 The decidua reflexa.
6 The chorion.
7 The decidua serotina.
8 The allantois and the situation of the future placenta.
9 The amnion.
10 The umbilical vesicle.
11 The umbilical cord.

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